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Monthly Cyclopedia and Medical Bulletin

(CONSOLIDATED)

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NEWS AND THERAPEUTIC HINTS.

Circumcision Wound.

Dean Miltimore, of Nyack, N. Y., writes that the following is an excellent application for circumcision after the first twenty-four hours. No bandage is required, the wound dries quickly, and a scab is formed in a few hours:—

℞ Phenolis liquefacti, f3ss.
Magnesii carbonatis,
Zinci oxidi, āā ℥ss.

M. Sig.: Shake. (Merck's Archives.)

Acute Asthma.

Mendel states that the crisis may be checked by plunging the hands of the patient in very hot water, or by the application of a mustard foot-bath. The fumes from a teaspoonful of the following powder ignited on a plate should be inhaled:—

℞ Potassii nitratis, 3iss.
Pulv. stramonii,
Pulv. belladonnæ fol., āā 3iv.

℞ Pulv. belladonnæ fol.,
Pulv. stramonii, āā 3iiss.
Potassii nitratis, 3ss.
Pulv. opii, gr. xv.

M. Sig.: One teaspoonful to be ignited in a saucer and the fumes inhaled.

If the bronchial secretion is very profuse, give the following:—

℞ Ext. stramonii, gr. iss.
Ext. belladonnæ fol., gr. iij.
Ext. opii, gr. iss.

M. et ft. pil. no. xx.

Sig.: One pill three or four times daily.

When the attack is very severe, one may resort to pyridine, a colorless and very volatile fluid of a strongly nauseating odor. About 10 drops are thrown on a handkerchief and the vapor inhaled; or, better, a teaspoonful of the fluid is poured into an open saucer placed in the middle of the room occupied by the patient. (Critic and Guide.)

NEWS AND THERAPEUTIC HINTS.

Ingrowing Toe-nail.

Good results in the treatment of ingrowing toe-nail may be obtained by dusting the affected part with a little powdered lead nitrate, after careful cleansing. A white scab forms, which must be removed on the following day; otherwise, pus is liable to collect underneath, the dusting being then repeated. The same treatment is followed from day to day as long as necessary. Liesching has been using this method for many years, with satisfactory results. (Liesching, in the British Medical Journal.)

Alopecia in Convalescents.

Brocq recommends that the hair be cut every five days for a period of two weeks and the scalp rubbed daily with the following preparation:—

℞ Glycerini,
Rum,
Tincturæ cantharidis, āā ♏lxxx.
Pilocarpinæ hydrochloridi, gr. viiss.
Olei santali,
Olei gaultheriæ, āā gtt. v.
Alcoholis, ʒiij.

M. et fiat lotio.

(Journal de médecine de Paris.)

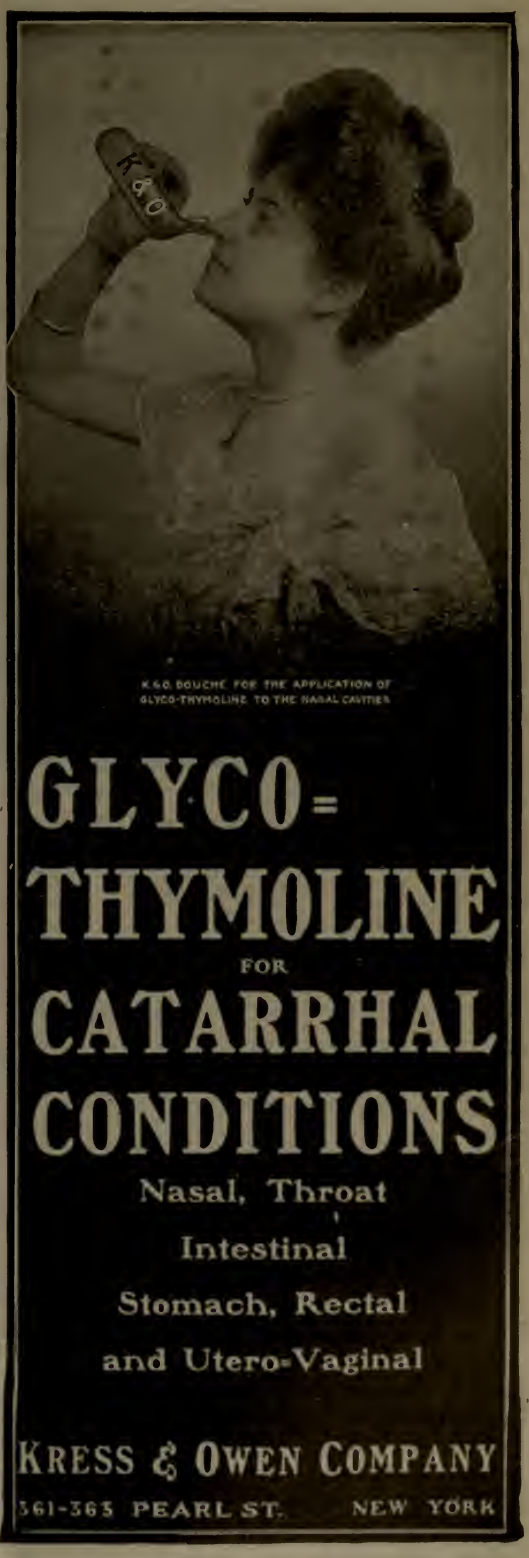
Hepatic Congestion.

Vires writes that where hepatic congestion is the result of heart disease the first indication is to lower the venous blood-pressure by venesection, wet cupping or by drastic or saline cathartics. For the first six to twenty-four hours, according to the intensity of the symptoms, only boiled water should be given, then milk diluted with boiled water, and finally milk alone, to the amount of 1½ liters a day, gradually increased to 2½ liters. The administration of digitalis is started at the same time. Diuresis may be continued with doses of 7½ grains of theobromine three times a day. Copious intestinal irrigations with cold boiled water, alkalies, saline purgatives, cholagogues in small doses and tub baths followed by massage of the whole body may be given. Where there is cardiac enlargement digitalis may be replaced by the following combination:—

℞ Ext. ergotæ,
Pulv. scillæ, āā gr. iss.
Hydrarg. chloridi mitis, gr. ¼.
Pulv. digitalis, gr. ⅛.

M. et ft. pil. no. j. Ft. tal. no. xxv.

Sig.: One pill three times a day. (Jour. des praticiens.)



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NEWS AND THERAPEUTIC HINTS.

Colic in Children.

℞ Infus. anthemidis,
Mist. rhei et sodii, āā ʒiij.

M. Sig.: A dessertspoonful when necessary.
(Med. Sentinel.)

Senile Pruritus.

℞ Acidi sulphurici dil., ℥lxxv.
Syrupi rubi idæi, fʒj.
Aquæ destillatæ, q. s. ad fʒvj.

M. Sig.: One tablespoonful every two hours.
(Merck's Archives.)

Vomiting of Pregnancy.

Asch (Berl. klin. Woch.) advocated feeding at intervals of two and one-half hours, with either solid or liquid meals; with the solid meals no liquid is allowed, but fluid is given copiously at other times. For the morning sickness he advises that a glass of milk, or a cup of coffee, chocolate, tea, or soup, be taken through a tube, the patient being in the recumbent position, and that rising be delayed for fifteen to twenty minutes thereafter. (Denver Medical Times.)

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NEWS AND THERAPEUTIC HINTS.

Inhalations for Chronic Bronchitis.

Place in six or eight different parts of the patient's room pieces of blotting paper which have absorbed 2 or 3 drops of the following mixture:—

℞ Menthol,
Eucalyptol, of each, gr. iv.
Oil of turpentine,
Oil of juniper, of each, ♏v.

(Medical Tribune.)

Sciatica.

L. W. Reynolds reports a case of sciatica, rebellious to baths, massage, blisters, salicylates, iodides, etc., in which injections of the following solution, repeated at different points along the course of the sciatic nerve, yielded, after a time, marked and lasting relief:—

℞ Antipyrinæ, ʒiiss.
Cocainæ hydrochloridi, gr. iiss.
Aquæ destillatæ, ʒiiss.

Fiat solutio.

The amount injected at each sitting was 16 minims. The injections caused no pain at the time, but considerable pain was always experienced about six hours afterward. The more closely to the nerve an injection was given, the greater the relief. Thus an injection over the external popliteal behind the head of the fibula was productive of marked benefit, and another on the dorsum of the foot completely removed the pain in four hours, after which it failed to return. At the conclusion of the treatment, in the course of which eight injections were given, the patient was able to resume his ordinary habits, considerable stiffness in the leg being alone experienced. (London Lancet.)

Scabies in Children.

Gaston, in Paris médical, is credited with the following combination, to be employed in washing the child in the evening:—

℞ Saponis castilliensis, ʒivss (17 Gm.).
Potassii sulphidi, ʒij (8 Gm.).
Olei olivæ, ʒiss (6 Gm.).
Olei thymi, ♏xiij (0.8 Gm.).

Misce.

Potassium carbonate, 2.5 to 5 drams (10 to 20 Gm.), should be added to the bath. After the bath the skin may be rubbed with a mixture of dilute camphorated oil, styrax, and balsam of Peru.

On succeeding days, the following ointment should be rubbed in:—

℞ Sulphuris præcipitati, gr. xv (1 Gm.).
Sodii boratis, ʒss (2 Gm.).
Zinci oxidi, ʒiiss (10 Gm.).
Adipis lanæ hydrosi,
Petrolati, āā ʒss (15 Gm.).

M. et ft. unguentum.

A starch should also be administered daily.

Where, as is frequently the case, scabies results in the production of eczema or impetigo, these may be treated by the application of balsam of Peru in oil (5 to 10 per cent.), or by the following ointment:—

℞ Sulphuris præcipitati,
Glyceriti amyli, āā ʒvj (25 Gm.).
Olei cadini, ♏lxxx (5 Gm.).
Sodii carbonatis, ʒss (2 Gm.).

M. et ft. unguentum.

(N. Y. Med. Jour.)

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NEWS AND THERAPEUTIC HINTS.

Tuberculous Ulcerations.

Every five days cauterize the surface with:—

℞ Nitrate of silver, gr. xv.
Distilled water, ʒj.

Touch the parts once a day with:—

℞ Lactic acid, ʒj.
Water, ʒij.

Dress with iodoform and destroy, when necessary, the peripheral nodules with the thermocautery. (Medical Press.)

Mucous Colitis in Children.

Whipham states that it is necessary to exclude sugars from the diet and to administer alkalies to dissolve the mucus. The following may be given before meals:—

℞ Potassii bicarbonatis,
Potassii citratis, āā gr. v.
Tinct. nucis vomicæ, ♏ij.
Inf. gentianæ comp., q. s. ad f3ij.

A rhubarb and soda powder, together with 2 grains of gray powder, should be given every night or every other night. (Merck's Archives.)

Calcium Salts.

The lime salts greatly aid digestion and for this purpose 1 Gm. calcium chloride may be given three times a day with meals. Animal experiments show that very large doses are well tolerated. The salt is also excellent as a tonic in various neurasthenic conditions, and will often initiate a marked gain in weight when food and other tonics fail. (R. Emmerich and O. Loew, in Berl. klin. Woch.)

Furuncle of the Ear.

G. Laurens, in Nouveaux remèdes, advises that a small, flexible wick of gauze be inserted in the canal and the patient be required to drop upon it every two hours a few drops of the following fluid, previously warmed:—

℞ Hydrargyri chloridi corosivi, gr. ⅔.
Alcoholis, ♏L.
Aquæ destillatæ,
Glycerini, āā ʒvj.

Misce.

The gauze wick should be changed daily. (So. Clinic.)

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NEWS AND THERAPEUTIC HINTS.

Lumbago.

℞ Potassii iodidi,
Potassii carbonatis, āā 3j.
Tinct. aconiti rad., f3ij.
Aquæ, f3x.

M. Sig.: Poison. Apply locally every three hours. (Erichsen, in Med. Fortnightly.)

Frost-bite.

℞ Ichthyolis, 3ij.
Ung. plumbi, 3iv.
Pulv. camphoræ, gr. xxx.

M. et ft. ung.

Sig.: Apply freely once or twice daily. Cover with cotton-wool. (Merck's Archives.)

Analgesic for Leg Ulcers.

℞ Anesthesin, gr. xx (1.25 Gm.).
Alcoholis, 3j (30 c.c.).

Drop or paint on ulcer and allow to diffuse and dry. A single application gives absolute freedom from pain for forty-eight or more hours, and relieves it for six or seven days longer. No ill results were seen. The alcohol produces a few seconds' smarting, but by its affinity for water enables the drug to penetrate. This is valuable when a fetid slough has to be cleansed. (A. Winkelried Williams, in British Medical Journal.)

Hemorrhoids.

In hemorrhoids consequent upon hepatic engorgement and intestinal atony, stillingia is said to be a specific, in the following method of exhibition:—

℞ Fluidextract of stillingia,
Tincture of belladonna,
Tincture of nux vomica,
Tincture of physostigma, of each, 3iv.

Sig.: Twenty drops in water before meals. (Critic and Guide.)

Swift Emetic.

The quickest emetic one can administer to child or adult is not apomorphine, but copper sulphate, 1 or 2 grains dissolved in a teaspoonful or two of water. It usually acts instantly. (Southern Clinic.)

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After LA GRIPPE, TYPHOID, Etc.
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NEWS AND THERAPEUTIC HINTS.

Sugar as an Oxytocic.

Keim is stated to have found sugar markedly efficient as a tonic to the uterus where its contractions flag in protracted labor. Its effect is exerted likewise on all other muscles of the body, for which, as a matter of fact, it is actually a pabulum. Its action is rapid and safe and its administration easy, and Keim considers it the best physiologic oxytocic agent. (Gazette médicale de Nantes.)

Diagnosis and Treatment of Ringworm of the Face.

Ringworm of the face presents, as a rule, no difficulty in diagnosis. The red and scaly circular patch, comparable to a burn, such as a hot coin might produce, and having its raised margins dotted with small vesicles, is sufficiently characteristic. Daily painting with weak alcoholic solution of iodine constitutes the treatment:—

℞ Tinct. iodi, ʒj.
Alcoholis, q. s. ad ℥j.

There is an eruption of the face which is commoner than any of those mentioned above, but which is seldom diagnosed correctly. The skin is red and glossy, and presents a finely cracked and scaly appearance. Such a condition is simply the result of the too frequent and too vigorous use of soap. Should any treatment, other than removal of the cause, be required, it is furnished by a zinc cream. (Guthrie, in The Prescriber.)

Anorexia.

℞ Tinct. amaræ (Ph. G. iv), 30 c.c.
Tinct. nucis vomicæ, 10 c.c.

M. Sig.: Twenty drops t. i. d. before meals.

℞ Tinct. cinchonæ,
Tinct. aurantii cort., āā 10 c.c.

M. Sig.: Ten to 20 drops t. i. d. before meals.

℞ Mentholis,
Tinct. amaræ,
Tinct. nucis vomicæ, āā 5 c.c.
Tinct. cinchonæ, 20 c.c.

M. Sig.: Ten to 15 drops one hour before meals. (Merck's Archives.)

NEWS AND THERAPEUTIC HINTS.

Persistent Hiccough.

F. H. Read (Med. Record) reports the relief of persistent hiccough by the use of 10 drops of a saturated solution of menthol in rectified spirits of wine, in a little hot water, to be repeated every hour if necessary. (Critic and Guide.)

Nervous Palpitation.

Ortner employs in this condition, as well as in all cases of neurasthenia associated with cardiac distress, the following:—

℞ Iron and quinine citrate, gr. xlv.
Strychnine sulphate, gr. j.
Fluidextract of kola,
Sodium glycerophosphate, of each, ʒvj.
Syrup of orange, ʒvij.

The first four ingredients are dissolved slowly with the aid of heat in the syrup of orange. The dose of this mixture is 1 teaspoonful three times a day after meals. (Med. Rec.)

Silver in Antiquity.

Silver became known to the ancients after they had long been familiar with gold, a circumstance to be attributed to the fact that it is isolated from its ores with more difficulty than is gold. Nevertheless, it was used in the most remote historic periods known to us. The Babylonians and Assyrians were acquainted with it, and the Israelites employed it in coinage under the name of keseph. In the time of King Solomon, Strunz tells us, silver was so plentiful that its market value declined. The Egyptians probably derived their supplies of silver from Spain through the Phenicians. An alloy of silver and gold was known to the Egyptians by the name of asm; this contained from 20 to 25 per cent. of silver, and received from the Greeks the name of elektros, later Latinized into electrum. Elektros must not be confounded with elektron, which was amber and found to possess the property of attracting light particles of pith and other substances after vigorous rubbing, and which has given us our modern word "electricity." The Greek name for silver is "argyros," derived from "argos," shining, whence the Latin argentum. Pliny says that "silver is never found but in shafts sunk deep in the ground, there being no indications to raise hopes of its existence, no shining sparkles as in the case of gold. The earth in which it is found is sometimes red, sometimes of an ashy hue. It is impossible, too, to melt it (*i.e.*, the silver ore), except in combination with lead or galena, this last being the name given to the vein of lead that is mostly found running near the veins of the silver ore. When submitted, too, to the action of fire, part of the ore precipitates itself in the form of lead, while the silver is left floating on the surface, like oil in water," and he goes on to tell that silver is found in nearly all the Roman provinces, but that the finest is derived from Spain. The separation of silver from gold, in which a chemical process is involved, was not known until the beginning of the medieval period. (Medical Fortnightly.)

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NEWS AND THERAPEUTIC HINTS.

Gastric Vertigo.

A. Robin recommends the following as an effective remedy in cases that do not respond to the use of simple carminatives and antacids:—

℞ Magnesium hydroxide, 0.3 Gm.
Prepared chalk,
Sodium bicarbonate, of each, 0.2 Gm.
Powdered nux vomica, 0.03 Gm.
Powdered belladonna root, 0.02 Gm.

This powder is to be taken after each meal, and at bedtime. (Bulletin général de thérapeutique; Med. Rec.)

Rule for Administering Unusual Fractional Doses of a Drug.

Aaronson, of New York, writes that he has devised a rule whereby one may readily administer any fractional dose of a drug, starting out with one of the standard tablets of known strength. Thus, if one has a tablet of morphine containing ⅛ grain, and if it is desired to administer 1/66 grain of this drug, the procedure is as follows: Take 66 minims of water and in this dissolve the tablet. Eight minims of this solution contains the required dose. This rule is applicable in the administration of any fractional dose, whether or not the denominator of the fraction is a multiple of the denominator of the fraction represented in the tablet as supplied by the manufacturer. (Jour. Med. Soc. of N. J.)

Chancroid.

K. Rühl, in Deutsche medizinische Wochenschrift, states that he has found useful in the treatment of chancroid the formula previously recommended by Chlumsk for infected wounds, furuncles, and felons, viz.:—

℞ Phenolis puri, ℥j (30 Gm.).
Camphoræ, ℥ij (60 Gm.).
Alcoholis, ℥iiiss (10 Gm.).

Misce.

After the affected area has been washed with a solution of mercury bichloride, gauze or cotton impregnated with the combination is applied. In deep chancroidal ulcerations Rühl leaves the phenol-camphor in contact for twenty hours. (N. Y. Med. Jour.)

Headaches

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NEWS AND THERAPEUTIC HINTS.

Chronic Otitis Media.

Joliat recommends the following for use in obstinate cases of otorrhea:—

℞ Acidi borici,
Bismuthi subnitratis, āā ʒj (3.9).
Acidi benzoici, gr. viij (0.52).
Formaldehydi, ♏v (0.3).
Glycerini, q. s. ad ʒj (30).

M. et ft. mist.; shake well.

Syringe the ear once or twice daily with a quarter of a liter of warm chamomile tea. Remove the fluid remaining in the external meatus by bending the head, and fill the concha with a large swab of absorbent cotton. With the patient lying down with the affected ear uppermost, fill the external canal with the mixture. Allow it to remain ten minutes, and then let the surplus run out. Dry the meatus or plug with cotton. Joliat has successfully used this treatment for two years, some of his cases being of years' standing. (Rev. hebd. de laryn.)

NEWS AND THERAPEUTIC HINTS.

Scabies.

Balsam of Peru, combined with sulphur, gives good results in the treatment of scabies. Montgomery recommends the following ointment:—

℞ Sulphuris præcip.,
Balsami Peruviani, āā ʒiij.
Adipis lanæ hydrosi,
Petrolati, āā ℥iss.

M. Sig.: Use externally. (Calif. State Jour. of Med.)

Nasal Catarrh.

The following has been well tried and gives excellent results:—

℞ Oil of pine,
Terebene, of each, ʒij.
Creosote,
Menthol, of each, ʒss.
Oil of cinnamon, ♏x.
Oil of eucalyptus, q. s. ad ℥j.

M.

Directions: Sprinkle a few drops on a handkerchief or cotton-wool and inhale through each nostril separately, or put a teaspoonful into a pint of boiling water and inhale the vapors. (Jour. Med. Soc. of N. J.)

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NEWS AND THERAPEUTIC HINTS.

Hot Liniment.

℞ Oil of mustard,
Chloroform, of each, f3j.
Ether, f3iv.
Alcohol, enough to make f3xlv.
(Druggists' Circular.)

Diuretic Mixture in Cardiac Edema.

Fürbringer and Kohlschütter recommends the following:—

℞ Infusion of digitalis, ℥v.
Tincture of strophanthus, gtt. xlv.
Citrated caffeine, gr. xxx.
Solution of potassium acetate (40 per cent.), 3xiiss.

The dose is 1 tablespoonful every two hours.

Ortner combines the infusion of digitalis with a double salt of caffeine. He frequently uses theocin or its preparations in conjunction with the infusion of digitalis. (Med. Record.)

Pain and Sleeplessness.

Dr. R. Jones, in the London Lancet, notes that tea and coffee drinking as well as the excessive use of alcohol and the various drug habits are frequent causes of sleeplessness. Intestinal autointoxication may be associated with sleeplessness. The latter may also be caused by beginning arteriosclerosis, in which case erythrol tetranitrate acts better than any sedative. Indirect remedies for sleeplessness associated with increased arterial tension are podophyllin, ¼ grain; extract of colocynth, 2 grains; aloes, 2 grains, and etatereium, 1/10 grain. By adding tone to the cerebral arterioles digitalis may act as a cerebral sedative, especially in the wakefulness of delirium tremens. When strychnine is used its effect is best kept up by alternating it with the tincture of nux vomica. Of the direct sedatives opium is at the head of the list. The conium preparations are generally unreliable. Chloral hydrate has the advantage of weakening and depressing the heart. Paraldehyde is a safe hypnotic in dose of ½ to 2 drams. Of all the sedatives the bromides are the most valuable to the nerve centers. They are best given in single large doses. Cannabis indica is useful in sleeplessness associated with migraine, asthma, or uterine spasm. Sulphonal is a strong neuronic poison. It should be used only for the sleeplessness of chronic cases. Urethane, given in 5-grain doses, is a safe and useful hypnotic. (Jour. Med. Soc. of N. J.)

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NEWS AND THERAPEUTIC HINTS.

Mouth-wash.

℞ Thymolis, gr. iv.
Acidi benzoici, gr. xlv.
Tinct. eucalypti, f℥ss.
Alcoholis, f℥iv.
Olei menthæ piperitæ, ♏iv.

M. Sig.: Mouth-wash. One teaspoonful in a glass of boiled water.

℞ Thymolis,
Benzosulphinidi, āā gr. iv.
Olei cinnamomi,
Olei caryophylli, āā ♏iv.
Olei menthæ piperitæ, ♏xxiv.
Tinct. krameriæ, ♏xl.
Alcoholis, f℥iv.

M. Sig.: Mouth-wash. One teaspoonful in a glass of boiled water.

℞ Benzosulphinidi, gr. xv.
Aquæ destillatæ, Oij.
Solve.

(Hugenschmidt, in Merck's Archives.)

Anomalies of Smell.

The curious psychical effects of stimulating the sense of smell are well known. It is still a moot point as to whether snuff-takers do not really stimulate their intellectual centers through the anterior lobes of their cerebral hemispheres when they irritate the olfactory mucous membrane. A habit so widely spread and so extensively practised as that of snuff-taking can hardly be supposed to depend entirely upon mimicry. There seems to be no doubt that the presence of some animals—the cat is the best-known instance—is really disturbing to persons of unusually acute sensibility, even when they are ignorant of its presence. In like manner, many people regard as unpleasant, or even insupportable, odors like those of apples or pinks, which are regarded as grateful by the majority of their fellows. Hammond, quoted by Gould, in his "Anomalies and Curiosities of Medicine," tells an extraordinary story in connection with the effect of disorders of the nervous system associated with peculiar odors. A young woman of hysterical tendencies exhaled the odor of violets. The odor was given off from the left half of the chest only, and could be obtained concentrated by collecting the perspiration on a handkerchief, heating it with 4 ounces of spirit, and distilling the remaining mixture. (The Hospital.)

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NEWS AND THERAPEUTIC HINTS.

Correlation Between Complexion and Resistance to Autointoxication.

I should like to call attention to the extraordinary variation in the resisting power of the individual as manifested by the color of the hair, not only to the changes in the fat and color of the skin already referred to, but to all other consequences of autointoxication. The darker the hair, the lower is the resisting power to autointoxication, and the more conspicuous are the changes which result from it. On the other hand, if the hair is red or of a peculiar towy color the individual has a minimum of resisting power to the action of these poisons, and that resisting power varies directly with the distribution and with the intensity of the redness of the hair. This is manifested very conspicuously in the influence exerted by the toxins on the appetites of the individual. The darker-haired subject will loathe the sight of food and frequently abhor any sexual relationship, while the red-haired subject rarely manifests these effects, even in the extreme conditions of intestinal stasis. This influence of toxins on the normal appetite is of far-reaching importance in our present state of civilization and is the source of much misery, discontent, and trouble, to which I will not do more than allude here. (Andrewes, in Proc. Royal Soc. Med.)

Gastrointestinal Catarrh.

℞ Creosoti, ♏iv.
Bismuthi subcarbonatis, ʒj.
Liq. calcis, q. s. ad ℥j.

M. Sig.: Tablespoonful t. i. d. (Med. Sentinel.)

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Tr. stramonii, āā ℥ij.
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M. Sig.: One dram t. i. d.

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Pulv. cascarillæ corticis, ℥ij.
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Department on the Internal Secretions

Original Articles and Summaries of Selected Articles

THE INTERNAL SECRETIONS AND THEIR LIMITATIONS.*

BY C. E. DE M. SAJOUS, M.D., LL.D.,

PHILADELPHIA.

THERE are features of our methods of investigation which, analyzed even by laymen, would evoke not only surprise, but merited criticism. A laboratory worker will perform an experiment or a series of them and, on the few more or less solid facts gleaned therefrom, will erect a theory. This theory may be faulty and fit with none of the data garnered from other directions; the experimenter himself may be untrained technically and scientifically; but it matters not; the man has performed experiments; hence his conclusions are entitled to consideration and are heralded far and wide. A vast aggregate of data furnished by a host of men working on such a plan cannot but lead to confusion and delay in reaching sound knowledge on any question. This applies particularly to the work being done on the ductless glands. Let us compare this plan with that of an investigator who, less pretentious as to his own technical abilities (on every branch of experimental knowledge, if you please), bases his conclusions on a broad survey of the scientific field of normal and morbid biology, *i.e.*, embryology, zoölogy, cytology, physiology, anatomy, histology, chemistry, clinical medicine, pathology, pharmacology, etc., and who selects only those experiments, clinical observations, etc., hundreds perhaps, by men of special competence in those branches, to arrive at a conclusion. Will this man, whose work is co-ordinated and systematic, who insists on perfect accord of *all* his conclusions,

* Read before the University of Pennsylvania Chapter of the Alpha Mu Pi Omega Medical Fraternity, Philadelphia, March 14, 1914. Published simultaneously in American Medicine.

those on one ductless gland fitting perfectly with those on all other glands, not be more likely to approximate the truth? While the first man will base his conclusion on, say, ten personal experiments, the second man will base his on, say, five hundred experiments performed by experts. Does this in itself not suggest greater precision on any question—as far as available knowledge will permit?

The latter plan is the one I adopted many years ago when my work on the Internal Secretions was projected. No one today, endowed with the least degree of fairness, can deny that steadily, as the experimental work on the ductless glands has progressed, my views have in many respects been confirmed. This must serve as my apology for the introduction, in the following remarks, of my own deductions.

The literature on the internal secretions nowadays is so confusing, owing to the total lack of co-ordination in the work carried on, that it is difficult to obtain any clear idea of the functions of any ductless gland. It has seemed to me, therefore, that a summary of these functions might prove interesting to you. You may be laboring, however, under the impression that, giving special attention to these organs, I am a rabid advocate of the idea, introduced by Brown-Séquard, that all organs produce an internal secretion. I would ask to be considered in precisely the opposite light, *i.e.,* as most conservative. Very few glands, from my viewpoint, produce an internal secretion in the sense that their product has a *specific* influence on the functions of all other organs as true hormones, *i.e.,* on the body at large. To endow with an internal secretion so many structures as is at present done undoubtedly serves greatly to obscure the whole problem and to hamper progress. It is because of this that the title of this paper refers to the limitations of the subject. Indeed, I will begin with the series of organs which do not appear to me, judging from the evidence available, to produce internal secretions.

Organs Having No Internal Secretion.

Pituitary Body.—This structure not many years ago was classed among the vestigial organs, but its functional importance asserted itself when Marie showed its intimate causal relation to the disease he termed acromegaly. Evidently it had some powerful influence over general nutrition. Gigantism was also associated with it, lesions of the pituitary being discernible in practically every instance. How does it exercise its influence?

The prevailing view at the present time is that it produces an internal secretion. It is composed of two parts: (1) a glandular or spongy portion composing the anterior lobe, and (2) a nervous portion, the posterior lobe, which includes a layer, the pars intermedia, that separates it from, but is in juxtaposition with, the anterior lobe. It is this pars intermedia which is said to produce the secretion that extracts of the posterior lobe, or the active material obtained from it, are supposed to represent. Now the weakness of the hypothesis is shown by the fact that the only glandular portion of the organ, the anterior lobe, the structure of which would suggest a secreting

gland, produces extracts which are inert, as shown by Howell, while the structure which produces active extracts is a nervous organ presenting no secretory characteristics and connected directly with the brain. The colloid masses supposed by Herring, Cushing, and others to be secretory products are present in the inert anterior lobe, but not in the active posterior lobe, according to Grünbaum. Indeed, there is ground for the belief, to which Halsted has recently added testimony, that the colloid found in large quantities in relatively inactive thyroids is an inert substance and not a secretion at all, its presence in the inert anterior lobe being additional proof of this fact. On the whole, we can certainly state with Swale Vincent that "it is extremely difficult to imagine how such a structure can be regarded as a secreting gland."

I have long held that the pituitary body is not a secreting gland. It serves, from my viewpoint, to co-ordinate two important though correlated functions: The first of these is to protect the body against disease and poisoning. The first part of the mechanism is the anterior lobe, a contractile organ through which the circulating blood passes, and in which the contents of the blood-cells, white and red, are in part evacuated. The cellular fluids and the plasma form a substance, the colloid, which passes through a vacuole between the anterior lobe and the pars intermedia of the posterior lobe and out through the lymphatics, their elimination being assisted by periodical contractions of the organ similar to those of the spleen, in which blood-cells are also broken up. On its way out, however, the colloid residuum comes into contact with the pars intermedia, which contains nerve cells resembling certain cells found in the olfactory area of the nasal cavities. I regard this portion of the pars intermedia as an important sensory organ having for its purpose to *test* the blood for any poison it may contain, just as the nasal olfactory area can test and detect unpleasant and often harmful emanations in the air. The sensory organ in the pars intermedia I regard as the homologue of the osphradium or test-organ found in lower forms, which has for its purpose to protect them by testing their respiratory fluid, sea water, represented in us by our blood. In the higher forms, including man, the protective impulses are transmitted from the sensory or test organ in the pars intermedia by way of the adjoining nerve cells in the posterior or neural lobe, up the infundibulum, along the base of the brain, the medulla oblongata, and cord, and thence through the sympathetic to the thyroid apparatus, adrenals, and kidneys. When a poison or toxin capable of exciting the test-organ (for some poisons depress it) occurs in the blood, therefore, the thyroid and adrenals increase their output so as to increase the antitoxic power of the blood at large, while the kidneys are stimulated to excrete with abnormal vigor the poison itself or the end-products into which it has been converted.

Have we any evidence of such a function in man? I might quote in this connection the observations of a believer in the secretion theory—an antagonist therefore—in reference to the after-effects of surgical removal of the pituitary body for tumor of this organ. "I wish to call attention,"

writes this observer, J. A. Flexner, of Louisville, "to the extreme susceptibility of these patients to morphine and to autointoxication, especially of purin origin." In referring to a personal fatal case, he states that "one twenty-fourth of a grain of heroin kept her narcotized for over a day," and he concludes that the "sudden and unexpected end was due to stopping of her glandular feedings and to the severe autointoxication which resulted from her careless dietary." Considered from my viewpoint, the woman, by losing her pituitary, had lost her power to oppose actively certain poisons, even those derived from foods.

Yet, the death is partly attributed to the absence of glandular feedings, meaning thereby the internal use of pituitary gland. There is no doubt of this, but, as noted by many physiologists,—Howell, Schäfer, and others,—extracts of the posterior pituitary and the gland itself cause effects, both general and toxic, which are identical with those of adrenal extracts. That in the posterior lobe the adrenal principle is present, though in close organic combination with other substances, is shown by the fact that when one applies the chromaffin test a marked positive reaction is obtained (Wiesel). This shows that the organ forms part of the chromaffin system, *i.e.*, of that system composed of adrenal tissue and sympathetic ganglia and nerves. The giving of pituitary gland to the patient helped her, therefore, because she received through it a part of the aid she would have obtained had her pituitary and its test organ been present to stimulate her adrenals.

This introduces the second function I attribute to the pituitary body, that is, to its neural lobe. Its connection with the chromaffin system stamps it as a sympathetic ganglion. I have long held that it is the chief ganglion of the sympathetic and chromaffin system, and that its nervous elements are highly differentiated cells, the axons of which follow the path outlined above, to become connected with the sympathetic system at large. But it will take many years, doubtless, even if my views prove to be sound, to develop fully the functions of the pituitary as I interpret them. It brings in features which themselves have not as yet been sufficiently fathomed to permit fundamental conclusions necessary to the mechanism as a whole. Yet, when we realize that not many decades have elapsed since sympathetic fibers were regarded as connective-tissue fibers, there is some hope that even the test organ will have its day.

Pineal.—This organ has had a varied career. Descartes thought it contained the soul; its connection with the pineal eye of reptilia and other low vertebrates caused it to be classed with the vestigial organs,—a convenient waste basket for structures the functions of which are unknown. Like the pituitary body, also classed formerly as a "vestigial organ," it has been raised to the rank of a useful organ. It contains neuroglia and what are regarded as secretory cells. Certain of its follicles contain what is termed "brain sand," also found in the choroid plexus and elsewhere, but devoid, as far as is known, of physiologic importance. As to the functions of the pineal, it is thought in some way, perhaps through a secretion, to control growth in the young. Destructive tumors of the pineal in children under the

seventh year may cause them to become abnormally tall and prematurely developed as to their genital organs, hair growth, and ossification. Obesity is occasionally observed in these cases. Yet the pineal does not seem to influence metabolism, judging from the results of removal. Notwithstanding this, the feeding of pineal gland to young animals by Dana, Berkeley, Goddard, and Cornell caused them to outgrow the controls rapidly in activity, size, intelligence, and resistance to intercurrent disease, while in children it appeared to benefit certain cases of retarded development, though not cases of total idiocy and gross physical defect.

From my viewpoint, although future labors may modify this attitude, the pineal does not possess the attributes of a secreting organ, the effects obtained with its extracts being accounted for through the fact that the large granular nuclei it contains in abundance are very rich in nucleins. It appears to me as being more of the nature of a nervous organ capable of influencing directly or indirectly the peripheral circulation and particularly that of certain organs, the genitalia and skin especially, during development.

Thymus.—There is no ground, in my opinion, for the belief that this organ is the source of an internal secretion. Its structure resembles greatly that of lymph-glands, the tonsils, etc., and is rich in leucocytes and large concentric corpuscles, known as Hassall bodies, the special functions of which have not been established. Other structures resembling the latter and known as myoid cells, owing to the resemblance of their elements to rudimentary muscle fibers, are also to be found. Although the organ is necessary to development, disappearing in most instances only at about the sixteenth year, its removal in the young does not necessarily prove fatal. While in certain animals, the guinea-pig, for example, the operation does not influence development, in others, puppies or young dogs, for instance, it causes anemia and leucopenia, with deficient nutrition, very marked cardiac dilatation, and death within a year. The series of events, as observed by Klose and Vogt, includes a period of obesity which lasts two or three months and one of idiocy lasting until death. The bones are then found to be atrophic, dwarf-like, and deficient in undissolved calcium. The fact that removal of the thymus in hens causes them to lay eggs without shells emphasizes the influence of the thymus upon calcium metabolism.

The stage of idiocy observed in dogs after removal of the organ recalls the autopsies of 89 children recorded by Katz and Bourneville. Of these, 25 had been mentally weak or epileptic; without exception these cases showed absence of the thymus, while the organ was normal in all other children.

These data, coupled with the facts that the thymus contains a nucleoproteid which is very rich in phosphorus (3.5 per cent.), and that these nucleoproteids and nucleins are the most prominent constituents of the protoplasm of all cells, and, as stated by Oliver and Schäfer, "the most probable antecedents of the internal secretions," led me to conclude in 1903 that "the thymus is the main organ upon which the osseous, cerebrospinal, and nervous systems depend for their phosphorus during their development." It is a temporary storehouse, in other words, from which the tissue-building leuco-

cytes gather the elements out of which the nuclei of tissue cells are formed. Nothing has been published since that has weakened my opinion that the thymus does not produce a true internal secretion.

Liver.—The prevailing view is—justly, in my opinion—that the glycogenic function of the liver does not belong to the category of an internal secretion. Urea has been termed by Biedl a "negative internal secretion," owing to its relative harmlessness, and because it is believed to excite the kidneys. When, however, we trace urea to its origin and realize that it is an end-product of toxic substance, protein wastes, ammonia compounds, etc., subjected to the antitoxic action of the liver, we can hardly consider it otherwise than as an excretory product.

Organs Having Autonomous Internal Secretions.

The second series of organs to which I shall refer are those which, from my viewpoint, do not produce an internal secretion possessed of a specific action throughout the body, but are intended only to influence those structures which form part of the mechanism to which the secreting organ belongs—the ovary, for instance, in its relations to the genital apparatus. This class might be termed *autonomous* internal secretions, to identify them from those which affect the body at large, the true hormones, as defined by Starling, who wrote recently: "By the term 'hormone' I understand any substance normally produced in the cells of some part of the body, and carried by the blood-stream to distant parts, which it affects for the good of the organism as a whole. The hormones are thus the chemical means of correlation of the activities of different parts of the body."

Testes.—Although the testes are thought to produce an internal secretion, orchitic extracts are known to owe their beneficial effects to nucleoalbumins, substances that are rich in phosphorus. The fact that beneficial effects have also been noted in obesity, eczema, psoriasis, and other disorders in which either thyroid or adrenal gland is of distinct value suggests that both of these substances are present in testicular preparations, besides the phosphorus-laden nuclear products to which their main therapeutic value is ascribed.

The presence of the adrenal principle reveals itself when the identity of the one testicular product which has given the best therapeutic results is inquired into. This product, known as spermin,—isolated by Poehl,—has given better results than the ordinary orchitic preparations, and in the same disorders. It is probably produced by adrenal rests in the testes similar to those in the kidney. When considered in the light of the functions I attribute to the adrenal secretion, spermin resembles it very closely. It is an oxidizing body which acts catalytically; it gives the guaiac and Florence's hemin test, thus showing that it is a constituent of hemoglobin; it is unaltered by boiling, and presents other characteristics of the adrenal principle. That it is a ubiquitous constituent of the organism at large is further shown by the fact that it is found in the blood of females as well as in that of males.

Brown-Séquard, in fact, found testicular extracts as efficient therapeutically in women as in men.

My own belief is that the testes do not produce a true internal secretion, but that they restore to the blood substances which they borrow therefrom to build up, with the product of their adrenal rests, their autonomous secretion. All these substances contribute also to the formation, in appropriate structures, of semen—both fluid and spermatozoa, the latter, as is well known, being rich in nucleins. The substances returned to the body at large include, therefore, besides what portion of the autonomous internal secretion the organs of the genital system have not utilized, the unused reserve of materials created for the process of copulation which Nature, never wasteful, turns to good account, particularly during growth, *i.e.*, during the presexual period of life. This view, which is here advanced for the first time, seems to me to elucidate many obscure questions. The debility, languor, mental torpor, and deficient growth noted in boys who indulge in excessive venery or masturbation is accounted for, while it explains the effects of castration. As is well known, this operation, when performed before the age of puberty, prevents the growth of hair, arrests the development of the thorax, pelvis, and larynx, the voice remaining childish—all phenomena which are precisely the converse of those caused by an excess of adrenal secretion, as we shall see—and the prostate and vesiculæ seminales failing to develop. Briefly, and even though the long bones grow inordinately though imperfectly, owing to disturbances in calcium metabolism, these subjects remain infantile, because of their total deprivation of the testicular product, which during development should have been entirely utilized by the organism at large.

Ovaries and Corpora Lutea.—There is considerable analogy between the characteristic effects of castration in the male and those following removal of the ovaries in young females. What remains of the genital organs, the uterus, vagina, and vulva, and also the breasts, retain their infantile type. In developed females there is a tendency to atrophy of the same structures and to obesity (also observed in men after castration), menstruation meanwhile ceasing. The influence of the ovaries on metabolism also corresponds with that of the testicles. The dictum of Brown-Séquard,—to whose remarkable physical improvement under the influence of testicular extract I can bear witness,—that this agent is more efficient than ovarian extract in the treatment of women, suggests a kinship between these two organic substances. This is emphasized when the pharmacologic action of ovarian extract is considered. Precisely as does spermin, it awakens all the characteristic effects of epinephrin: it raises the blood-pressure, slows the heart, and raises arterial tension, while in castrated animals it enhances oxidation. That it influences general metabolism is shown by the fact that ovarian extract increases the excretion of urea and phosphoric acid. As stated by Mulon (1904), in fact, the corpus luteum presents all the morphologic characteristics of an aggregate of chromaffin cells, to which class the cells of the adrenal medulla also belong.

Here again, it seems to me, we are not dealing with a true internal secretion, as regards a fixed function in the organism at large. As far as available evidence permits us to judge, the ovary produces a secretion which sustains metabolism and nutrition of the *sexual apparatus,* of which the ovaries, the secreting organs, themselves form part, and also of the menstrual function. During the intervals—only from my viewpoint, please remember—the unused excess is absorbed into the general circulation, not as a special secretion or hormone, but as a part of the general asset in adrenal and thyroid secretions, nucleins, etc., with which the functions of the general organism are usually carried on. When the ovaries are removed or when menopause occurs, the organism is deprived of two of the structures which contribute to the general welfare certain substances, among which the epinephrin-like principle, and possibly nucleins, may perhaps with some degree of certainty be mentioned. I need but recall the effects of oöphorectomy and the menopause to emphasize the phenomena that attend the loss of the ovarian function.

After ovulation, which occurs during menstruation, the corpus luteum is formed. This organ is also credited with an internal secretion; but the latter acts also within the reproductive system, its purpose being, according to prevailing views, to augment markedly the nutrition of the uterus and assist in the fixation of the embryo. It seems also to insure the development of the mammary glands after conception has occurred, and to continue to do so during the earlier months of pregnancy. But as the mammary glands form part of the reproductive system, this action does not warrant the inclusion of the ovary among the true ductless glands.

Kidneys.—The belief that the kidneys are the source of an internal secretion does not rest on solid data. The renal veins do not seem to contain any sort of active agent. The renal extracts produce a rise of blood-pressure so suggestive of that of the adrenal secretion that various authors have called attention to it. Bingel and Strauss note besides that "the action of rennin, like that of epinephrin, is exerted in the muscles of the peripheral vessels." Like epinephrin, it produces dilatation of the pupil. These effects are readily explained, however, by the fact that the renal tissues contain adrenal rests, those islets of adrenal tissue from which renal hypernephroma is well known to develop. On the whole, it is possible that these adrenal rests are themselves the source of an adrenal secretion—in organic combination perhaps—and that this secretion may serve to sustain metabolism in the gland itself; but the existence of a true renal internal secretion, of value to the organism at large, is extremely doubtful.

Organs Which Produce an Internal Secretion.

We have now reviewed those organs which, to me at least, appear to produce no internal secretion, and those which produce an autonomous internal secretion specific only to the organs concerned with a single function. I shall now refer to those structures which undoubtedly produce an internal

secretion or hormone capable of influencing the entire organism. These are at present so familiar to every one, however, that but little time need be devoted to them.

Thyroid.—But fifteen years ago, about all that could be said confidently of the thyroid gland was that it yielded a secretion which subserved a useful purpose in the body and that the effects observed after removal of the organ were probably due to loss of this function. It had been suggested that the gland also destroyed waste products, but the evidence was deemed insufficient (Schäfer, 1898). Today, through the labors of many investigators, we have learned not only that the thyroid and parathyroids deeply influence general metabolism and the process of growth, but that they take an active part in defending the body against infections and other toxemias. As Vincent expresses it, "the extreme liability of thyroidectomized animals to various infective conditions is strong evidence in support of the view." This connection of the thyroid with the general process of immunity, in contradistinction from a specific action on wastes, I had pointed out in 1903, before, I believe, any other writer, both metabolism and the protective function being carried on in conjunction with the secretion of the adrenals. Later, in 1907, I submitted evidence which had led me to conclude that the thyroid and parathyroid secretions constituted the substance which Wright had termed opsonin, pointing out, however, that this substance sensitized not only bacteria, toxins, etc., but also tissue elements, wastes, fats, etc., to facilitate catabolism—a function in which also ferments, as more recently held by Abderhalden, took part. All the more salient features of my conclusions were subsequently sustained experimentally by others. A functional connection between the thyroid and the adrenals was found actually to exist by Kraus and Friedenthal, Kostlivy, and Hoskins; a direct connection between the thyroid and the production of opsonins has been established by Fassin, Marbé, and others.

Summarizing the functions of the thyroid and parathyroids, it may now safely be said that their secretions are essential to the metabolism and development of the body, while taking part in the processes which protect it against infections and intoxications.

Adrenals.—As is well known, the adrenal secretion, represented by its active principle, epinephrin, raises the blood-pressure and increases the power of the cardiac contractions, while slowing the heart, as shown by Oliver and Schäfer in 1894. A couple of years earlier Abelous and Langlois had urged that the secretion of the adrenals destroyed certain products of muscular metabolism. It has been established also that the adrenal secretion sustains the tone of the sympathetic system, and through it the cardiac and vascular muscles and circulation. Through this action it governs the vascular supply of all vegetative organs, *i.e.*, those concerned with growth and nutrition. Moreover, as more recently shown, it governs the sugar content of the blood, thus influencing carbohydrate metabolism, so important to muscular activity. These functions may be said to have received general acceptance.

As to the views which are still *sub judice*, I may recall that, beginning

with 1903, I submitted that the adrenals carried on functions of greater importance than those just mentioned. By pointing out that the adrenal secretion was the key to tissue respiration, the previously unidentified "oxidation ferment" of Schmiedeberg, Jaquet, and others, the manner in which it caused vascular contraction and thereby regulated the blood supplied to the various organs was explained, each organ being studied in turn. The glycogenic function of the liver was also gone over, and the relations between the adrenal secretion, glycogen, and muscular tissue I held at the time differ little from the views since advanced. In addition to these functions, I urged that the adrenals co-operate with the thyroid secretion and other substances to destroy not merely, as believed by Abelous and Langlois, toxic products of muscular metabolism, but also toxins and poisons of all kinds that are capable of acting as antigen, the adrenal secretion itself being an antibody. These views still await development and final experimental proof, but there is no doubt in my mind that the adrenal secretion will be proven to take an active part in oxidation and general metabolism. For the time being, however, we can only assert that it sustains the tone of the cardiovascular system, and perhaps of the skeletal muscles, and that it influences carbohydrate metabolism.

Stomach.—The secretion of gastric juice of psychic origin, that is, produced by the sight of luscious food in man, of meat by a hungry dog, etc., is totally prevented by division of both vagi. The influence of these nerves is further shown by the fact that, when the peripheral cut end of one of these vagi is stimulated, gastric juice is secreted. While the importance of the nervous mechanism of the stomach in the process may be emphasized, this is evidently not the only resource, for it has been shown that after the stomach has been wholly disconnected from the nervous system in an animal its functions are not materially impaired. This is due to the fact that the mucous membrane of the stomach contains an internal secretion, which in turn excites the gastric mucous membrane to secrete. The internal secretion referred to is not, however, obtainable from the fundus; it is specific to the pylorus.

Most authors state that this secretion is not a ferment, because it is not destroyed by boiling, but from my viewpoint this conclusion is not warranted. There is an oxidizing ferment in the gastric juice,—and derived from the blood,—which I have termed adrenoxidase, that is not destroyed by boiling a certain length of time. Be this as it may, the fact remains that we are justified in stating that the pylorus produces an internal secretion or gastric hormone which, carried through the blood to the gastric glands, excites them and causes them to secrete gastric juice.

Intestine.—Claude Bernard showed long ago that the passage of food into the duodenum provoked a flow of pancreatic juice into the intestine, but this was first ascribed to a nervous reflex. Popielski, Wertheimer, and LePage discovered, however, that this occurred when all nerves were cut upon introducing acid into the small intestine almost anywhere excepting within a couple of feet of its termination. Bayliss and Starling then as-

certained that the acid did not directly influence the pancreas through the intestinal mucous membrane, but that it caused the latter to secrete a substance which, on being carried through the blood to the pancreas, excited the latter to secretory activity. The substance secreted by the intestinal mucosa proved to be an internal secretion, which they termed "secretin." Since then, secretin has been obtained from parts of the intestine other than the duodenum, and from the stomach.

Although the organs of the digestive system, in so far as the gastric and intestinal hormones are concerned, might be included among the autonomous internal secretions owing to their apparent functional restriction to the stomach and intestines, there is some ground for the belief that even they will eventually be shown to participate in the general functions of the body, as I urged in 1907. This is emphasized by the recent labors of Abderhalden.

Pancreas.—Removal of the pancreas in animals gives rise to diabetes. We should expect that ligation of the duct of Wirsung would produce the same effect, since it is through this duct that the pancreatic secretion reaches the intestine. Yet ligation of the duct is not followed by the disease. It is evident, therefore, that it is through some other factor which is suppressed by removal of the organ that it is caused. What is this factor? The bulk of evidence indicates that, as first pointed out by Lépine in 1889, an internal secretion is produced by the pancreas in addition to that which finds its way into the intestine through Wirsung's duct, and that it is the absence of this internal secretion which in the operated animals causes diabetes.

The source of the pancreatic internal secretion is still a moot point, but the preponderating view is that the islets of Langerhans—structures which vary in number according to the degree of nutrition to which the body is subjected, inanition, *e.g.,* causing them to increase greatly in number—produce it, and, moreover, that they sustain carbohydrate metabolism. Hence inhibition of the functions of these islets through sclerosis, hyaline degeneration, etc., whether the rest of the pancreas be involved or not, as shown by a large number of autopsies, gives rise to diabetes precisely as is the case when the organ is removed.

How does the pancreas sustain carbohydrate metabolism? Does it influence the formation of glycogen or its conversion into glucose; or, again, does it influence the metabolism of sugar in the tissues? If we restrict ourselves to inhibition of the pancreatic function as a cause of diabetes, a hopeless confusion soon occurs. Indeed, there exists a diabetes due to the opposite condition, *i.e.,* excessive activity of the islets of Langerhans, for we know that epinephrin, thyroid gland, pituitary gland, and splenic extract, administered in suitable quantities, and likewise pregnancy, in which the ductless glands are overactive, all cause glycosuria. It is reasonable to suppose, therefore, that various ductless glands influence the islets through their hormones or secretions, and that it is *because* they sustain carbohydrate metabolism that, in excess, they produce glycosuria. This led me to suggest, long ago, that we should divide our cases of diabetes into two classes: the *asthenic* cases, constituting the majority, those in which the pancreas was functionally

deficient, either through local lesions or through paucity of the agencies, hormones, etc., which activate the pancreatic cells; and the *sthenic* cases, those in which, either through an excessive production of these hormones, as in infectious diseases, excessive irritability, emotional stresses, local inflammation, etc., the pancreas was overactive. Be this as it may, the fact remains that the participation of various ductless glands in carbohydrate metabolism is now generally recognized. When, therefore, we speak of the pancreas as sustaining carbohydrate metabolism, we must in all likelihood consider the organ as one only of the structures participating in the process.

It may prove of advantage to call the attention of those of you who may wish to do laboratory work in this connection to what, from my viewpoint, is an experimental error which is retarding progress by suggesting false theories. Certain experimenters have reported that epinephrin could inhibit the functions of the pancreas, but an error lies in the fact that they used doses above the proportion of epinephrin ever present in the blood, and, therefore, produced sufficient contraction of the arterioles to the pancreas to reduce greatly the arterial blood supplied to this organ. As function in any organ is dependent upon the proportion of arterial blood it receives, they erroneously concluded that the epinephrin could inhibit the production of pancreatic secretion.

The manner in which the pancreatic internal secretion is influenced by other ductless glands in the production of glycosuria—diabetes being ascribed to pancreatic lesions—has remained obscure. In 1903-1907 I offered an explanation which is gaining ground in so far as the experimental work on the subject is concerned. This explanation was that both the adrenals and thyroid, when overactive, can produce glycosuria by increasing, through their secretions, oxidation and metabolism in the pancreas, which they reach through the blood. The pancreas being thus caused to produce an excess of amylopsin, which in turn acts on the hepatic glycogen, sugar is formed beyond the needs of the tissues at large and the surplus of sugar is eliminated with the urine. This is the *sthenic* form previously referred to. In the *asthenic* form the adrenals and thyroid are insufficient, and, metabolism in the pancreas being correspondingly impaired, alimentary glycosuria occurs precisely as it does after removal of, or degenerative lesions in, the pancreas. The glycosuria of infectious diseases, from this viewpoint, would be due to excessive oxidation—incident upon the febrile process—in the pancreas, in addition perhaps to that of the tissue glucose in the body at large.

Leucocytes.—Another function of the pancreas, suggested by myself in 1903-1907 (see pp. 668 to 745, Vol. I, in the first four editions, and pp. 885 to 907, Vol. II, in the first six editions of "Internal Secretions and the Principles of Medicine"), was that the pancreatic ferments, through the intermediary of certain leucocytes, take part in the nutritional functions of tissue cells. The more recent labors of Abderhalden indicate that he has reached a similar conclusion in so far as the participation of leucocytic ferments in cellular metabolism is concerned. His labors have received prominence recently, especially through his pregnancy

test. Abderhalden holds that each cell, including the leucocytes, absorbs nutritive substances, submits them to digestion by means of enzymes it contains, and uses the end-products as material to replace its own materials as fast as they are being used up. Even though the cells of the different organs differ in structure according to their functions, they are all supplied with their nutritive pabula in the same way. As Abderhalden has done since, I also attributed to ferments, both in the tissues and in the blood, the autoprotective phenomena that take place therein, and that are brought into activity when certain poisons, toxins, etc., occur in the blood.

The Internal Secretions in Therapeutics.

The subdivision of the organs reviewed into inactive, autonomously active, and active glands may serve to elucidate the therapeutic action of either division of these organs. The specificity of the cells constituting an organ (as differentiated from that of the cells of any other organ) suggests that when this organ is employed therapeutically we should obtain its specific *general* effects only when using *true* ductless glands, *e.g.,* the thyroid or adrenals. In the case of the autonomous glands, the specific effects would affect only the organs of the system, *e.g.,* that of reproduction, under the influence of the autonomous gland of that system. The action of these autonomous secretions on the body at large, though due to by-effects, would be of major importance, however, in that they would be necessary to the physiologic dynamism of all cells by contributing substances normally utilized in the physiologic upkeep of all tissues. As regards the glands deprived of a true internal secretion, their action would be that of their chemical constituents, those of the posterior pituitary, for example. The nucleins of the thymus, however, would contribute to the actual physiologic needs of the body up to puberty, disappearance of the organ coinciding with completed development. All this coincides with the teachings of clinical experience, and seems to raise the whole subject out of the field of empiricism.

There is a vast opportunity for fruitful development in this direction—a bewildering one indeed in its possibilities. And this may be said of the entire subject of the ductless glands. When we know all their relations with metabolism and with the autodefensive resources of the body, a great stride will have been made in our strife against disease.

PRESENT STATUS OF THE SURGERY OF SYSTEMIC GOITER.*

By WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D.,
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Intracapsular Enucleation.—Enucleation of the goiter nodules from the more or less preserved thyroid tissue, according to Socin, is feasible in all encapsulated goiters. Unfortunately, the operation in many cases is impossible without severe hemorrhage. Results with regard to recurrence are as favorable after this procedure as after extirpation of the diseased half of the organ. Paralysis of the inferior laryngeal nerve may be avoided by proper care, and an existing paresis of this nerve has been known to subside after intraglandular enucleation.

Evacuation or exenteration of the goiter nodules, a procedure consisting in their incision and the removal of the contents, is very rarely indicated.

Resection of the goiter is performed especially in the presence of multiple nodules, or in parenchymatous goiter, when enucleation is not called for.

Partial Thyroidectomy or Strumectomy.—In the majority of cases partial thyroidectomy is limited to the lobe of the gland which is seriously enlarged, usually the right. Almost two-thirds of the goiter may be removed in this manner, without curtailing the thyroid parenchyma. Partial thyroidectomy is often simplified in systemic goiter, as compared with ordinary goiter, by the small volume of the tumor, which is rarely deep seated. However, adhesions with neighboring structures are very common. The greatest danger consists in the acute and often fatal disturbances which have been observed to follow immediately upon the operation, even when this is restricted to the very simple manipulations, and probably due to thyrotoxicosis.

In the opinion of Kausch, bilateral wedge-shaped excision of the goiter, according to Mikulicz, is preferable to unilateral extirpation (Kocher's operation), largely on account of the better safeguarding of the recurrent laryngeal nerve and the parathyroids. Berry, however, has been for many years "in the habit of removing such portions of the thyroid gland as seemed advisable, without paying any attention whatever to the parathyroids." There is a tendency to credit a persistent thymus with a considerable part in the pathogenesis of systemic goiter. It is important that this factor be borne in mind in the treatment of the disease.

Vascular Ligation.—Ligation of the superior and inferior thyroid arteries, on one or both sides, in one or several sessions, has been recommended in order to induce atrophy of the goiter, especially in the rapidly growing parenchymatous goiters of youthful individuals, in cases of systemic goiter, and also as a preliminary operation with the hope of improving the condition enough to allow a more radical operation at a later time. In severe

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* Summary of article in the Journal of the Michigan State Medical Society, April, 1914.

cases successive ligation of first one and then another artery may be done under local anesthesia. Being more accessible, and not related to any important nerves, the superior thyroid arteries are usually selected for the ligature. Ligation of the inferior thyroid is a very difficult and rather severe procedure, which should be reserved for special cases. The place of election for the ligature is directly internal to the point where the thyroid artery crosses the common carotid. The ligature is applied flush with the carotid, at a distance from the gland, and therefore from the recurrent nerve. The chief difficulty is referable to the chronic inflammation of the tissues surrounding the goiter. The mortality of vascular ligation, both single and double, in the worst types of the disease, in Mayo's experience fully equaled or exceeded the mortality of thyroidectomy. The method, however, now has an accredited position in the treatment of systemic goiter.

Selection of Operative Method.—In the unilateral type of systemic goiter, always favorable for operative interference, three-fifths of the goiter may be removed after the patient has been prepared by improving the general condition. Kocher considers operative procedures indicated in all goiter cases where an increased function of the thyroid gland can be demonstrated by clinical observation and examination of the blood. Two or three of the main arteries may be tied, first on one side, then on both sides. In case the result is not sufficient, a portion of the goiter may be extirpated at a third session.

Vascular ligation and partial thyroidectomy have been combined in such a way that unilateral excision is performed with ligation of an artery of the opposite side. This procedure is advocated by Landstroemme. In recurrent goiters an attempt may be made to induce atrophy of the remaining lobe through application of a ligature around one or both of the remaining arteries. If the reaction after the ligation of the vessels at the left upper pole be not severe, the right lobe, the isthmus, and possibly a portion of the left lobe are removed by Mayo at a second operation.

Operative Results.—Definite end-results were compiled in 320 of Kocher's operative cases. Complete cure was obtained in 150 patients, while 148 still presented individual symptoms of the disease, such as protuberant eyes or functional disturbances of thyroid origin, but with marked general improvement. The outcome was unsatisfactory in only 22 cases, either because the operation could not be completed, on account of recurrence, or because secondary disturbances of the kidneys or the liver failed to subside after the operation.

Of 167 patients operated in the Mayo clinics, 70 per cent. were cured; 19 per cent. improved; 5.8 per cent. slightly improved, and 5.2 per cent. not improved.

Klose's statistics, dealing with 298 cases, show 64 per cent. cures (2 to 18 years); 24 per cent. improvements; 3 per cent. not cured; 2 per cent. recurrences, and 22 cases, 7 per cent., deaths.

Concerning the functional results after operative procedures, the dyspnea and dysphagia which most frequently require intervention are amen-

able to improvement, provided they are due to the goitrous enlargement itself. Nearly asphyxiated patients not uncommonly regain free and easy respiration on the day of the operation. Difficulty in swallowing is apt to persist and even increase during the first week following the operation, after which time it gradually subsides. As soon as the operation has stopped, there is usually an end of the cardiovascular disturbances, such as tachycardia, palpitation, or persistent edema of an upper extremity. The results are not so positive when the structure of the myocardium has been affected, although even in these cases there is often a striking improvement. Aside from exceptionally unfortunate cases, in which myxedema follows even on limited resections, the signs of thyroid insufficiency gradually subside, the remaining lobules of the gland assuming increased activity.

The recurrent nerves, being in closest contact with the goiter, are apt to be profoundly altered by it. In some cases, where the muscles of the larynx had not become entirely atrophied, the removal of the thyroid swelling has been known to relieve even total laryngoplegia. In several observations of Roux and of the author the patient's hoarse and goitrous voice became perfectly normal after the operation. Bérard noted two cases in which the ablation of the goiter relieved neuralgic disturbances of the upper extremity, with incipient atrophy of the muscles of the shoulder.

ACTIVITY OF THE BRAIN AND ADRENALS IN RESPONSE TO SPECIFIC STIMULI.*

By F. W. HITCHINGS, M.D.; H. G. SLOAN, M.D., and J. B. AUSTIN, M.D.,
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Report of 66 experiments undertaken to ascertain some of the conditions which activate the adrenal glands, and determine more exactly this relation. The method of testing adrenal activity used was that originated by Cannon. The test depends on two facts: (1) that epinephrin inhibits the activity of smooth muscle fibers of the intestines; (2) it is a readily oxidizable substance. Using a segment of small intestine of a urethanized rabbit, contracting rhythmically in warm oxygenized blood, and recording its contractions on a smoked drum, blood from the animal under experiment is tested as a control. If the intestine continues to write the assumption is that the blood contains no epinephrin. The animal is then given, *e.g.*, a bacterial toxin, and a double amount of blood taken as soon as the toxin has produced its effects. Part of this blood is used for the epinephrin test. If no inhibition of the intestine be produced the experiment ends at this point. If it be produced the second portion of blood is allowed to stand for twenty-five minutes in order to allow the epinephrin to oxidize, and then the third, or oxidization, test is made. If the oxidization test be negative the assumption is that the

* Summary of article in the Cleveland Medical Journal, October, 1913.

substance that caused the inhibition was oxidizable, and epinephrin is the only substance in the body that produces inhibition of the intestine which can be oxidized in twenty-five minutes. If, on the other hand, a second inhibition be obtained the chances are that the agent used is still present in the blood in sufficient amount to cause it directly. In a typical experiment with the control test negative, the toxin test positive, and the oxidation test negative, the assumption is that the toxin, or whatever other activator was used, caused the injection (discharge) into the blood of epinephrin from the adrenal glands. It was found that epinephrin production caused by peptone is prevented by blocking the adrenal nerves, whether this be done by severing the splanchnic nerves (major and minor); by blocking them with a local anesthetic; by cutting under and around the glands, but leaving the adrenal vein intact; by clamping off the glands, and, finally, by removing the glands altogether. It was also found that with the glands left intact large doses of morphine will likewise prevent the epinephrin reaction.

Substances experimented with included the toxins of gonococci, of streptococci, of staphylococci, of colon bacilli, of tetanus bacilli, and of diphtheria; foreign proteids, indol and skatol, leucin, creatin, feces extract, strychnine, morphine, phenol, Witte's peptone, sheep serum, ox serum, and kitten serum. All of these seemed to cause adrenal activation. Narcotics and anesthetics caused no increased output of epinephrin. The psychic strain of inducing anesthesia usually caused epinephrin output, and in consequence it was always necessary to wait twenty-five minutes before testing the control blood. As a corollary of experiments in which the splanchnic nerves were cut it became evident that epinephrin-activating agents acted through the central nervous system rather than directly or through a hormone. The various agents which caused increased epinephrin output caused either fever or motor activity, while the agents which caused no increased epinephrin output, or which diminished it, were either neutral as to motion and fever or diminished them. There was observed in cats an epinephrin reaction after a heavy emotional stress, the cat being subjected to a seance of great rage and fear by having a muzzled dog try to fight with it. To find out whether the fear and rage activation of the adrenal gland operates directly through the nerve connection between the brain and the adrenal, or indirectly through a hormone action, the adrenal supply of cats was interrupted by dividing the major splanchnic nerves on both sides. Then after several minutes, when the cats were otherwise entirely normal, they were again subjected to intense emotion, rage and fear being produced as before. There was no epinephrin reaction in any of these animals, *i.e.*, the adrenal glands must have been activated from the brain.

Additional studies were made, consisting in observation of the changes occurring in the nerve-cells in the experiments already described, as well as in certain other conditions. The cells were classified as hyperchromatic, active, fatigued, or exhausted. One of the striking facts was the rapid production in many cases of a hyperchromatic condition. With the return to normal this hyperchromatism disappeared in from four to five hours, but if

the stimulus was extreme and long continued the hyperchromatic stage did not last long and most of the cells were found in the so-called fatigued state; and if the stimulus persisted, the cells went on to the exhausted state. Whatever the cause of the changes in the brain-cells, it was found that the cortex and the cerebellum showed more marked changes than did the base of the brain and the cord. Of great significance was the fact that all the agents that produced an increase of epinephrin output caused also a hyperchromatism of the brain followed by exhaustion. It mattered not whether this stimulating agent was physical exertion in running, in fighting, or in convulsions; was the emotion of fear or of anger, or a reaction to anaphylaxis, to toxins, to indol, skatol, foreign proteids, or strychnine—in every case hyperchromatism and increase of epinephrin output went hand in hand.

After the injection of a toxin or of live bacilli the hyperchromatic state was very fleeting, and unless the brain was examined in a very short time this stage gave way to that of fatigue. After the injection of an extract of feces, of skatol, or of indol the cells were nearly all fatigued in one-half hour. With tetanus toxin there was fatigue and some exhaustion after one-half hour. Among drugs, sodium salicylate, leucin, creatin, and nicotine gave a marked hyperchromatic state after one-half hour. Injection of epinephrin gave an extreme hyperchromatic state, which did not change to the fatigued state for five hours. Injection of a dog's own macerated thyroid gland gave a decided increase in the hyperchromatic cells. Injection of thyroid extract, 8 grains, resulted in slight hyperchromatism after thirty-seven minutes. In ten minutes after a single physiologic dose of strychnine there was marked hyperchromatism. After two such doses the number of hyperchromatic cells decreased and the fatigued cells increased in number. After double adrenalectomy, injection of a single physiologic dose of strychnine produced only a slight degree of hyperchromatism, neither as marked nor as constant as in the animal with the adrenals intact. There was a rapid loss of the stainable material after a removal of both adrenals. After the removal of the entire pancreas, on the other hand, the cells were all hyperchromatic and active.

RÔLE OF OVARIAN DISEASE IN THE PRODUCTION OF STERILITY.*

By GEORGE W. KOSMAK, M.D.,

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Of ovulation, in respect to the time at which it takes place in relation to the menstrual periods, we are still more or less in ignorance, and whether each menstrual period is necessarily accompanied by the discharge of an ovum cannot be stated definitely. In the presence of a cystic ovary which

* Summary of article in the New York State Journal of Medicine, December, 1913.

does not functionate, menstruation and apparently ovulation go on regularly, but the author has been impressed with the idea that although the menstrual function is apparently not inhibited in such cases, a Graafian follicle with its contained ovum does not always rupture on each occasion, for in many instances where such disease of the ovary is present sterility is an accompaniment. He believes that marked cystic degeneration of the ovaries is the central and important factor in the production of the sterility in certain instances. In a case which he reports it seemed clear that the irritation and disturbance produced by the presence of a cystic ovary had in itself acted as a bar to successful fertilization, conception taking place soon after the diseased ovary had been removed. It would be considered radical to advocate the removal of a cystic ovary in all such cases, however, particularly if the enlargement was not of a marked degree and likewise if instead of a cystic ovary one were dealing with adnexal tissues that were the seat of inflammatory processes. Yet it might appear advisable to do this if children were desired and this lesion on the part of the mother was discovered to be the only obstruction to pregnancy. While such ovarian disease may not be the only cause in the individual case, it undoubtedly constitutes a contributing factor and may possibly be of greater moment than abnormalities in position, etc., of the uterus and cervix.

One often finds that the removal of a diseased ovary tends not only to relieve specific symptoms referable to it, but also apparently to cause increased function on the other side.

In collecting a series of 45 cases from various operators the author was desirous of obtaining information not only as regards the relief of sterility, but also as to the effect of the removal of one ovary on the sex of the child. The attempt in the latter direction was, however, unsuccessful, as in the entire series there were 16 male and 13 female infants following the removal of the right ovary and 16 male and 15 female infants following the removal of the left ovary—a fairly equal division of the sexes.

In the 19 cases of the series in which pregnancy had not preceded operation, the öophorectomy was done in 3 women while they were still single and in 7 in a year or less after marriage. In the remainder the operation was done in from four to ten years after marriage. In 3 cases pregnancy followed in less than a year, in 10 cases in less than two years, and in 3 cases between five and six years (although several abortions occurred in one case of the latter series). As regards the sex of these children, in cases where the left ovary was removed there were 8 males and 9 females subsequently born, and where the right was removed there were 5 males and 8 females.

On the whole, there seems to be no question from the observations thus far made by a number of writers that the question of sterility in an otherwise healthy woman must depend on an aggregation of factors rather than on a single lesion, and that in every instance the entire pelvic contents must be subjected to careful study. In a certain proportion of cases, however, the removal of an ovary which is diseased undoubtedly contributes to increased function in the other, as evidenced by an improvement in the menstrual conditions and the greater possibility of subsequent pregnancies.

USE OF EPINEPHRIN FOR PROPHYLACTIC PURPOSES BEFORE SALVARSAN INJECTIONS.*

By DR. GALLIOT,

PARIS, FRANCE.

Whatever precautions be taken to secure a pure, undecomposed solution of salvarsan or neosalvarsan for injection, a certain number of patients is always met with who are hypersensitive to the drug, sometimes to salvarsan only, sometimes to neosalvarsan only, at times even to both. Milian's procedure, consisting in the previous injection of 1 mg. ($\frac{1}{65}$ grain) of epinephrin, appears to be the best method of prophylaxis against these "nitritoid attacks" brought on by the specific remedies. The author has used epinephrin for the same purpose, but has given it by the mouth, 15 to 20 drops of the 1:1000 solution being administered in a little water ten to fifteen minutes before the injection. Excellent results are claimed for this simple measure. Thus, 2 patients are referred to who had always experienced a "nitritoid attack" after neosalvarsan injections. Immediately after the injection the face would become congested, a tingling sensation in the throat be complained of, and nausea and even sometimes vomiting accompany these phenomena. No further symptoms developed after epinephrin had been given as prophylactic, the patients experiencing no discomfort of any kind, either on the day of injection or subsequently. These patients had already received several injections of 0.3 to 0.45 Gm. of neosalvarsan, always accompanied by mild nitritoid attacks, and the author had not thought it wise to exceed the doses mentioned. As the congestive disturbances entirely disappeared after the use of epinephrin had been begun, however, 0.6 Gm. was then injected, without any difficulty resulting. The epinephrin had not yet been tried by mouth in cases of nitritoid attack due to old salvarsan. In view of the simplicity and harmlessness of the measure, however, it is likely to be of some service, more particularly in timorous patients.

PATHOGENESIS OF EXOPHTHALMOS IN BASEDOW'S DISEASE.†

By DR. MAURICE,

LYONS, FRANCE.

Exophthalmos is considered by the author the sole truly typical sign of Basedow's disease. If, as a few maintain, tachycardia and thyroid enlargement are sufficient to warrant a diagnosis of this affection, what term should be applied to those cases in which, in association with thyroid enlargement,

* Summary of article in Paris médical, January 24, 1914.

† Summary of article in Lyon médical, October 20, 1912.

tachycardia, and nervousness, there occurs a manifest enophthalmos? It might be stated that such cases would later pass into Basedow's disease—that they are goiter cases on the way to becoming exophthalmic. Such a supposition is often disproved, however, by the facts. Signs of hypothyroidism are numerous in these cases; the successful treatment is that by thyroid extract, and the usual course of the disease is that of thyroid instability terminating in cachexia of myxedematous type.

Exophthalmos is a manifestation of excitation of the cervical sympathetic. The latter leads to dilatation of the postocular vessels causing propulsion of the eyeball forward (Abadie), or to contraction of the smooth muscle of Tenon's capsule or of Landström's fibers, such contraction projecting the eye anteriorly (Jaboulay). The last theory alone warrants attention, but thus formulated it is not complete. The excitation of the smooth muscle fibers cannot attain its maximum effect unless associated with a paresis of the extraocular muscles. The existence of such paresis is indicated by the frequency of external ophthalmoplegia in Basedow's disease (Ballet, Bristowe) and of convergence paralysis (Moebius's sign); likewise by the observation of histologic changes in the ocular muscles (Bristowe), and, in a general way, by the myotonic state of the striated muscles in Basedow cases.

Whence originates the excitation of the cervical sympathetic which is the cause of the exophthalmos? Is it due to the thyroid secretion? Experiments by Ballet and Henriquez, Fürth and Schwarz, Lépine, and others have shown that among the symptoms of artificially induced hyperthyroidism tachycardia is frequent, but exophthalmos quite rare. Boinet, in a student who had ingested 6 to 8 sheeps' thyroids, witnessed mental disturbance, intense palpitation, and tremor, but no exophthalmos. Kostlivy has shown that most cases of exophthalmic goiter present both lymphocytosis and epinephrinemia. Kraus, Friedenthal, A. Fränkel, Trendelenburg, and Bröking have all confirmed the latter, and, according to Gallavardin, the epinephrinemia accounts for the slight rise in blood-pressure noted in exophthalmic goiter. High blood-pressure and exophthalmos are also often simultaneously present in chronic nephritis, and a number of authors have attributed the high pressure in these cases to hypertrophy of the adrenals. The author is inclined to believe that this latter condition also accounts for the high pressure and exophthalmos in Basedow's disease. The thyroid secretion is not, indeed, antagonistic to that of the adrenals, but rather stimulates it and sensitizes the organism to the action of epinephrin. From the synergistic action of these two secretions arises a maximal degree of sympatheticotonic effect and a more marked depression of the central nervous system.

In all progressive cases of exophthalmic goiter the attentive observer, according to Maurice, can detect the passage of the disease from a thyroid to an adrenal phase. The patient, previously presenting thyrotoxic symptoms such as small goiter, tachycardia, nervousness, tremor, etc., at the time of transition to the adrenal phase develops slowing of the pulse with high vascular tension perceptible to the palpating finger, propulsion of the eyeballs with a tendency to paralysis of their straight muscles, and, finally, a neuras-

thenic state with anorexia, physical weakness, and loss of interest in life. In one of the author's patients, *e.g.*, there appeared six months after the onset of Basedow's disease a very marked bilateral exophthalmos. At the same time the pulse rate dropped from 200 to 140, and the Pachon sphygmomanometer showed a systolic pressure of 180 mm. Hg.

The synergistic hyperfunctioning of the thyroid and medullary portion of the adrenals reduces, in particular, the functional vitality of the medullary centers of the pneumogastrics; the sympathetic function, on the other hand, is enhanced. It is this loss of equilibrium between the two functions which leads to the typical Basedow syndrome, with the exophthalmos. The labors of Hess and Eppinger, of Falta, and of Gautrelet have, indeed, demonstrated the close relations existing, on the one hand, between the reproductive glands, pancreas, and central nervous system, and, on the other, between the thyroid, adrenals, and sympathetic. Lortat-Jacob and Laubry, pupils of Landouzy and Vaquez, have shown, furthermore, that orchidectomy or oöphorectomy greatly favors the production of atheroma. In Basedow's disease, in which amenorrhea and hence ovarian insufficiency are frequent, and in which epinephrinemia has been noted, arteriosclerosis accordingly threatens. This supplies an additional feature of the exophthalmos-producing adrenal phase of exophthalmic goiter.

Thus it may be concluded, according to Maurice, that a case of exophthalmic goiter running its full course generally passes through a phase of excessive adrenal functioning, manifested clinically by exophthalmos, increased pulse tension, and symptoms of visceral arteriosclerosis. Operative or postoperative untoward phenomena are to be feared in this stage of the disease, and are due either to degeneration of the nerve-cells of the pneumogastric nuclei or to cardioarterial sclerosis, which does not permit of conducting general anesthesia under favorable conditions. Medical treatment, however, is without danger. Opotherapy as practised by Brown-Séquard, conducted with perseverance, especially with appropriate diet and drug treatment, gives satisfactory results. It has enabled the author to restore to an agreeable, sociable life patients long since deprived of physical and mental stamina, the exophthalmos, goiter, and tachycardia meanwhile likewise showing notable improvement.

IODINE AND PHOSPHORUS CONTENTS, SIZE, AND PHYSIOLOGIC ACTIVITY OF THE FETAL THYROID GLAND.*

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In previous communications the author had shown that fetal thyroid tissue possesses a strong selective affinity for iodine, that the glands of beef fetuses contain an appreciable amount of iodine as early as the third month

* Summary of article in the Journal of Biological Chemistry, May, 1913.

of intrauterine life, or approximately six months before maturity, and that the iodine content increases proportionately with the age of the fetus. More recently, the glands from 705 beef fetuses six to nine months old were secured and analyzed within a short time after collection. It was found that the individual fetal thyroids varied enormously in size and materially in color. It was noticed also that fresh beef thyroids, containing 0.3 per cent. or more of iodine on the dry fat-free basis, both from fetuses and adult animals, possessed a peculiar, pungent, garlic-like odor, resembling both that of phosphine and of phosphorus while undergoing oxidation. The odor was especially pronounced when the glands were cut open while they still retained the animal heat, and disappeared gradually upon chilling. The usual preliminary and identification tests for free phosphorus, free iodine, and hydrogen sulphide were all negative. It was, therefore, concluded that the substance causing the odor, if an iodine-phosphorus compound, must be an organic complex. That this is associated with or entirely dependent upon the quantity of iodine in thyroid combination was, however, very apparent.

Fetuses possessing enlarged glands, although otherwise apparently well proportioned, invariably were smaller than the fetuses with normal glands. The amounts of iodine in the normal fetal glands, in spite of considerable unevenness in size and age, were much more uniform throughout the entire year than those of the thyroids from full-grown animals and it seems apparent that the seasonal change in iodine content, which is so evident in the healthy glands from mature animals, is not pronounced in the normal fetal thyroid. Normal fetal glands are relatively larger and contain more iodine and phosphorus per unit of body weight than thyroids from fully mature animals. The male glands are somewhat larger than the female thyroids, the average weight being 9.9 Gm. for the male and 9.3 Gm. for the female, but the smaller female glands contain a higher percentage of iodine than the male glands. A striking feature was the high percentage of abnormally large fetal glands. The percentage of goitrous glands in grown animals, even during the cold season, was far inferior to that found in the fetuses. There is a gradual decrease in the percentage of affected glands as the animals mature. The demand for iodine in the rapid fetal metabolism and growth, in certain instances, evidently may exceed the supply available in the pregnant animal. This supply may be sufficient for the maintenance of the maternal metabolism, leaving the adult thyroid normal, but not sufficient to prevent iodine starvation and enlargement of the fetal gland.

In spite of their size the enlarged glands contained less total iodine and much more total phosphorus than the normal thyroids. This peculiar condition held true of fetal as well as adult glands. Since accumulation of organic phosphates does not occur in normal glands of average iodine content, the idea readily suggests itself that iodine in thyroid combination may be a factor of vital importance in the phosphorus metabolism of the body.

Abstracts from Current Literature on the Internal Secretions

Syndromes from Adrenal Disease.—The author refers particularly to tumors in the adrenal glands, or simple hyperplasia, stating that, in his experience and judging from the literature, these conditions are invariably accompanied by atrophy of the internal genital organs. The typical findings are proliferation of the adrenal cortex plus atrophy of the ovary. The disturbances which result from this combination are of four types: (1) adrenal pseudohermaphroditism; (2) adrenal virilism; (3) the menstrual type, and (4) the obstetric type.

1. In the first form the secondary sexual characters develop early and are of a male type, so that pseudohermaphroditism may be regarded as a sign of simple hypertrophy of the adrenal cortex. 2. When there is an actual tumor in this cortex the male characteristics become exaggenerated, with obesity, hypertrichosis, and menstrual disturbances. In young girls puberty comes on early and with male characters; in a boy the sexual development is premature. In men there is a tendency to premature general weakness, and women become masculine in their muscular strength at first, but then nervous, mental symptoms developing, with irritability and dread. 3. Dysmenorrhea is the principal symptom of the third or menstrual type in women over 20. There is always more or less hypertrichosis or pigmentation, and there may be symptoms of exophthalmic goiter. 4. The obstetric type is like the others except that it manifests itself first with a pregnancy, usually extrauterine.

In one of the author's cases the patient died in convulsions and coma, due to hemorrhage in the adrenal, which was the seat of an adenoma. Ovarian extract therapy supplies the lacking internal secretion of the ovary in this class of cases, and is the logical treatment combined with removal of the cause, the adrenal tumor, when practicable. Wendel has compiled 6 lumbar operations for adrenal tumor, with 4 deaths, and 17 transperitoneal operations, with only 7 deaths. A. Gallais (Revue de gynécologie, January, 1914; Journal of the American Medical Association, March 28, 1914).

* * *

Exophthalmic Goiter Cured by Ligation of One Superior Thyroid Artery.—Operations on the thyroid should be performed under local anesthesia whenever possible, the advantage consisting in the nerve-block, which completely isolates the brain from the field of operation. This prevents the shock and exhaustion of the brain-cells, which are largely responsible for the severe reaction that frequently follows thyroid operations. Ligation should be preceded by several days' rest in bed while the operator gains the confidence of the patient. This eliminates much of

the shock due to fear. One hour before operation the patient should receive a dose of morphine or morphine and hyoscine, sufficient to allay restlessness and prevent psychic shock.

In the case the history of which is given by the author, ligation of the right superior thyroid was done in the patient's home under local anesthesia. The patient went back to his work two weeks after the ligation and has not missed a day from work since then. He received ergotin, 1 grain, with quinine hydrobromide, 2 grains, and thyroidectin, 3 grains, three times daily, for two months. He then noticed that there were intervals of several days without the pulse rate increasing on exertion. During the third month he took the medicine about half the time, then stopped it entirely, as all symptoms had gone. Two weeks after the ligation both thyroids began to enlarge symmetrically, this gradually increasing for six weeks, and for a short time the patient was unable to wear a collar; but the nervousness, insomnia, and psychic storms had disappeared and the tachycardia and exophthalmos were rapidly improving. In the third month the enlargement began to subside and within three weeks had entirely disappeared. L. F. Watson (Medical Record, September 27, 1913).

* * *

Diabetes Insipidus and Infantilism.—Case of combined diabetes insipidus and infantilism. The patient was a young man aged 24. He had developed normally up to the age of 14. Shortly after a shock, sustained by involuntary immersion in cold water through falling out of a canoe, he began to pass large quantities of urine, 7 or 8 liters a day, and to suffer from polydipsia. These symptoms persisted, but there was never either sugar or albumin in the urine. At the age of 16 the patient's teeth all dropped out in the course of a few months as the result of painful ulceration of the gums. A year or two later generalized eczema of severe type appeared, and proved very intractable. On examination the youth was found to present well-marked signs of infantilism. There was no hair on the face or pubes, and only one or two sparse hairs in the axillæ. His voice had not "broken." There was double testicular atrophy, and the penis was very small, like an infant's. There was complete absence of sexual desire and power. No objective ocular signs were found, however, and the sella turcica was seen radioscopically to be of normal size and appearance. The patient's mental condition was good. While under observation he often passed as much as 10 liters of pale, limpid urine in the twenty-four hours. Hypophyseal, thyroid, testicular, and pancreatic extracts were tried in turn during four months, but all failed to modify the patient's symptoms materially. The authors are of the opinion that the condition was due to defective function of the pars intermedia, usually described as belonging to, or, at least, mainly associated with, the pars posterior or nervosa of the pituitary gland. P. Lereboullet, M. Faure-Beaulieu, and E. Vaucher (Nouvelle iconographie de la Salpêtrière, September-October, 1913; Lancet, February 21, 1914).

Case of Pluriglandular Insufficiency.—The patient was a Russian girl aged 24 of epileptic and diabetic ancestry. She had been normal in every way up to the age of 18 years, when she developed ophthalmoplegia. When approximately 20 years old she developed a species of myxedematous state, attended by suppression of the menses. A physician found glycosuria and a positive Wassermann reaction. Later the author discovered a spinal curvature. The progress of the case suggested myxedema to the exclusion of other affections. At the same time there was a shrinkage in the body measurements, owing to various deformities. The bone condition developed some resemblance to osteomalacia. Death occurred unexpectedly from erysipelas, thereby giving an opportunity for autopsy. Radiography had shown a normal sella turcica, but the hypophysis, normal in size, was found adherent to the bone and of firm consistence. Thymus remains were abundant, while the thyroid was abnormally small in both lobes. The pancreas was small, consisting largely of fat and connective tissue. The adrenals were normal to the naked eye. The ovaries were abnormally small and showed no Graafian follicles. The bones were very much thinned and brittle. The liver was fatty. The other organs were normal save for the heart, which exhibited the changes to be expected after death from erysipelas. The author explains this case on the assumption that the condition of the thyroid was responsible for myxedema and possibly for certain psychic manifestations, but beyond that he could not go, save perhaps to hold the abnormal pancreas responsible for the diabetes. The adrenal bodies alone of all the endocrine glands were normal, so that the case may be termed subtotal. In no other similar case reported has there been glycosuria. Masse (Berliner klinische Wochenschrift, January 19, 1914; Medical Record, February 14, 1914).

* * *

Pituitary Extract in the Treatment of Rachitis.—The 16 children to whom the author administered pituitary extract belonged to the families of peasants or workmen and were subject to such unfavorable factors as damp dwellings, poor light, etc. In order to be able better to judge of the value of the treatment, care was taken not to modify the diet or environmental conditions of the little patients. For the earliest cases of the series 3 control children were also provided, *i.e.*, children with rickets and of about the same age as the others, but not receiving pituitary extract, magnesium oxide or lactose being given instead. When the treatment in the original cases was finished, the controls were themselves subjected to pituitary medication. From time to time the size of the fontanelle was noted as a measure of the effects of the treatment on osseous growth. In some children radiography was also availed of. Most of the children treated were 1 to 2 years of age, but were unable to walk, stand, or even, in some instances, to sit up. After a few weeks of pituitary treatment, these children were able to stand and began to walk, and at the same time the fontanelles began to close and the growth of the teeth was considerably accelerated. Osseous tenderness

gradually diminished, the children no longer crying when made to stand; a regular gain in body weight was noted, and the musculature became firmer. Combined administration of calcium carbonate with the pituitary extract did not seem to yield an improvement any more rapid than that afforded by the pituitary extract alone. K. Weiss (Semaine médicale, July 23, 1913).

* * *

Action of Blood-serum upon Aqueous Organ Extracts.—Previous experiments had shown that the acute lethal action of intravenously injected aqueous organ extracts was diminished or abolished by fresh blood-serum. The work now reported confirmed this finding, and showed also that the extract and serum must be present in certain relative amounts and the mixture allowed to stand a certain period of time before injection, if the detoxication is to take place. The amount of serum required for neutralization of a dose of extract lethal in a rabbit of about 2400 Gm. weight was found to be from 0.5 to 1 c.c., and a preliminary period of fifteen minutes for interaction between the serum and extract was found necessary for complete detoxication of the latter. Perhaps this detoxication by fresh serum results from combination of the fibrinogen still remaining in the serum with the fibrin ferment or tissue coagulin existing in the aqueous extracts; or, this ferment may be rendered inactive by the serum in some other way. H. Dold (Berliner klinische Wochenschrift; Zentralblatt für innere Medizin, March 29, 1913).

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Relation of Thymus to Bony Growth.—The author's work points toward the thymus gland having some relation to the growth of bones. Its removal in young animals (rats and guinea-pigs) led to changes indistinguishable from those in human rickets, the animals showing imperfect growth. There occurred also enlargement of the thyroid gland. The author demonstrated the capacity of the thymus to regenerate. After partial thymectomy in rabbits there occurs a rapid regeneration, so that in a few days numerous cells and nuclei appear. The so-called embryonic lymph-cells became transformed into the true thymus-cells; these must, therefore, not be regarded as true lymph-cells, for the thymus is an epithelial organ. L. Aschoff (Lancet, August 16, 1913).

* * *

Rôle of the Ductless Glands in the Genesis of Fibroma Molluscum Gravidarum.—Fibroma molluscum gravidarum, one of the hypertrophic disturbances of the skin arising in pregnancy, is due to cessation or inhibition of the ovarian function and to an increase in the activity of the pituitary and adrenal glands. The lesions of fibroma molluscum gravidarum usually disappear as involution from the pregnant state takes place. But in some instances they remain indefinitely: some of the growths retain their pigment; others lose it. S. M. Brickner (Journal of Surgery, Gynecology, and Obstetrics, October, 1913).

Action of Extracts of the Posterior Pituitary.—Injections of extracts of the posterior lobe of the pituitary in the rabbit cause disturbances of the auriculoventricular conduction apparently quite independent of any action on the vagi. Rabbits in which the vagi have been cut react in the same manner as unvagotomized animals, which permits of concluding that the pituitary preparation exerts a selective action on the fibers of His's bundle, of inhibitory nature and short duration. Claude, Porak, and Routier (Société de Biologie, Paris; Revue des sciences médicales, August, 1913).

* * *

Effect of Thyroid Extract on Epinephrin Glycosuria.—Thyroid extract, injected in combination with adrenal extract, causes a notable increase in the glycosuria produced by the latter. Addition of thyroid extract to Takamine's adrenalin likewise increased the resulting glycosuria. There is no exact relation, however, between the amount of sugar excreted and the amount of thyroid injected. The results are less striking when the two products are not mixed, but injected separately at two different points of the body. Garnier and Schulmann (Société de Biologie, Paris, February 21, 1914; Paris médical, February 28, 1914).

* * *

Route of Access to Tumors of the Pineal Body.—The author describes an operative procedure for exposure of the pineal similar to that followed by von Monaco for the purpose of freely exposing the central portions of the cerebrum in dogs. The several steps of the operation include extensive superior median craniotomy, ligation of the longitudinal sinus, retraction of the falx, separation of the two hemispheres, and partial splitting of the corpus callosum. F. Nassetti (Policlinica, xx, 11; Zentralblatt für Chirurgie, February 7, 1914).

* * *

The Hypophysis After Thyroidectomy.—Thyroid glands removed *in toto* from 12 adult rabbits. The hypophyses were always found heavier than in control animals. After some six months had elapsed from the date of experimentation, the pituitary was found to have increased to about three times its normal size. Degener (Quarterly Journal of Experimental Physiology, p. 111, 1913).

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Pituitary Extract in Obstetric Practice.—The action of pituitary extract in post-partum uterine inertia is inferior to that of ergot derivatives. It is worth trying as a galactagogue and in post-partum retention of urine. A. Turenne (Annales de gynécologie et d'obstétrique, December 7, 1913).

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Metabolic Effects of Thyroid.—The thyroid was found in dogs to hinder the assimilation of sugar. The parathyroid glands favored it. Edmunds (Journal of Pathology and Bacteriology, July, 1913).

Department on General Medicine

Original Articles

THE VALUE OF ANATOMY AS APPLIED TO THE DIAGNOSIS OF MEDICAL CONDITIONS.

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(*Concluded from the March issue.*)

2. Transferred Abdominal Pain in Intrathoracic Disease.

Although John Hilton, in the late fifties and early sixties of the last century, called attention to this comparatively frequent condition, citing illustrative cases, both unilateral and bilateral, many reports have been published in recent years of abdominal operations performed for supposed abdominal conditions, where nothing was discovered at the time, but which were later diagnosed as pneumonia with an associated pleuritis, serous or other form of pleurisy, aneurism, a new growth, or even spinal caries, mediastinitis, or pleuropericarditis. One writer, in a paper in the London Lancet some years ago, described 11 such cases in which abdominal section had been unnecessarily performed. In the majority of instances, when abdominal rigidity and pain are due to intrathoracic lesions, the lesion is unilateral and situated in the lower portion of the thorax, for only the last six intercostal nerves send their anterior branches of supply to ramify in the preperitoneal tissue of the abdominal wall, as Ramström has shown. When pain and rigidity are bilateral, one is dealing either with some condition in which the pleuras of both sides are implicated or with a caries or new growth, these latter being instances of root-zone involvement through pressure, though, of course, pressure may be exerted on one side only, in which case plus tension and tenderness will occur in some portion of the abdominal wall of the same side, *i.e.,* unilaterally. Peritonitis, typhoid perforation, appendicitis, and disease of the gall-bladder may all be closely mimicked when the actual lesion is within the thorax, and in numerous instances operation has been performed unnecessarily.

The natural inference is that every case of abdominal pain and rigidity demands a careful physical examination of the chest as well as the abdomen

in order that intrathoracic disease may be excluded as the direct exciting cause or possible complicating factor. Since abdominal pain, tenderness, and plus tension, varying in position and intensity according to the etiology, may result from intrathoracic and intra-abdominal disease or pressure, and in the latter group especially, as the autonomic cerebrospinal arc is everywhere dependent upon them for its completion, and, finally, because of their import in lumbosacral and sacroiliac disease, as well as various pelvic and genitourinary diseases and reflex symptoms, we have included both lumbar and sacral nerve groups in describing the distribution of a thoracic nerve.

To understand the production of an area of transferred pain, and at the same time to appreciate muscular phenomena such as spasticity in somatic musculature in the presence of intrathoracic and intra-abdominal disease, it will be necessary to study the distribution of the thoracic, thoracicolumbar, and lumbosacral nerves, together with their sympathetic relations.

A typical thoracic nerve is traced as follows: Leaving the cord as a mixed nerve, there is first given off the posterior primary division, which passes dorsally through the musculature of the back, and sends cutaneous filaments to the overlying integument. Ventrad to this branching, the trunk, which we will now call the anterior primary branch, passes, to be at once joined to the sympathetic cord by means of the rami communicantes. Entering the interval between the anterior costotransverse ligaments and the external intercostal muscles, the nerve comes to lie in the intercostal plane between the external and internal intercostal muscles, and thence courses forward, giving off the lateral cutaneous branches. Proceeding to the mesial limit of the external intercostal muscles, it is then covered by the anterior intercostal membrane as it lies upon the internal intercostal muscle, and as an apparent terminal the anterior cutaneous branch is given off. This description will answer for all of the thoracic group save the first, second, and twelfth.

The *first* thoracic sends a considerable proportion of its fibers into the brachial plexus. A lateral cutaneous branch is rare, and the anterior cutaneous may be wanting.

The *second* thoracic contributes a branch known as the intercostohumeral, which is directly related to the lesser internal cutaneous of the brachial plexus (reflected arm pain in angina pectoris).

The *twelfth* thoracic or subcostal is below the last rib, and its lateral cutaneous branch not only supplies abdominal integument, but passes downward over the crest of the ilium, supplying the gluteal integument as far as the upper level of the great trochanter.

The thoracic nerves may be divided into two groups: The upper, more horizontally placed seven, properly called thoracic nerves, and the lower more obliquely placed five, readily called thoracicoabdominal. The muscular branches of the upper group supply the following muscles: External and internal intercostals, subcostals, levatores costarum, serratus posticus superior, triangularis sterni, and rectus abdominis (upper portion). The lower

group supply: External and internal intercostals, subcostals, levatores costarum, serratus posticus inferior, external and internal oblique, transversalis, rectus abdominis, pyramidalis, and diaphragm. The diaphragm, according to Luschka, receives twigs from the lower six thoracics. The cutaneous distribution also deserves mention. The lateral cutaneous branches of the upper six pierce the external intercostals, and those of the lower six pierce the external oblique in a line about midway between the midaxillary and mammary lines. Once the lateral cutaneous branches reach the integument they divide into an anterior and posterior set. The posterior pass backward to the field occupied by the lateral twigs of the posterior primary branches, while the anterior twigs pass ventrally to the field occupied by the anterior cutaneous branches. The anterior cutaneous branches of the trunk of the nerve constitute the terminal branches in both upper and lower groups. Those of the upper six pierce the pectoralis major near the sternal border, and supply the adjacent integument in the parasternal region. Those of the lower six vary as to the line of perforation, but, generally speaking, they puncture the ventral rectus sheath somewhere between the linea alba and the linea semilunaris. Now, it is to be noted that the anterior cutaneous branches of the seventh supply the integument in the region of the umbilicus, and that those of the twelfth supply the region midway between the umbilicus and pubic crest.

Next in logical sequence we shall consider the distribution of some of the branches of the lumbosacral plexus.

The iliohypogastric, coming off from the first lumbar nerve, and communicating with the twelfth above and the ilioinguinal below, is the analogue of the last thoracic. Its iliac branch, corresponding to a lateral cutaneous branch of the thoracic group, pierces the internal and external oblique muscles above the middle of the crest of the ilium, is deflected downward, and is distributed to the integument covering the gluteal medius and tensor fasciæ femoris. It inosculates with the lateral cutaneous branch, continues the course of the nerve trunk, and, just above and mesad to the external abdominal ring, it traverses a foramen in the aponeurosis of the external oblique, and terminates in filaments of supply to the integument of the suprapubic region. The muscular twigs of the iliohypogastric supply the transversalis, internal and external oblique muscles.

The ilioinguinal, springing from the twelfth thoracic, or first lumbar, or second lumbar, or the loop between first and second lumbar, parallels the iliohypogastric. It crosses the quadratus lumborum *behind* the kidney, pierces the transversalis, lodges in the cleft between it and the internal oblique, and then inosculates with the iliohypogastric. Continuing forward, it enters the inguinal canal, and finally emerges from the external ring or its lateral pillar, below and to the outer side of the spermatic cord. It contributes filaments to the transversalis, internal oblique, and external oblique, and sends branches to the integument of the upper, inner thigh region, pubic region, base of the penis and scrotum in the male, mons veneris, and greater labium in the female.

The genitocrural, from the first loop of the plexus and second lumbar nerve, divides into genital and crural branches. The genital branch contains first lumbar fibers, passes forward through the inguinal canal, and enters the scrotum. It supplies the external iliac artery, cremaster muscle, integument of the scrotum, and adjacent thigh region. In the female it accompanies the round ligament, and is distributed to the integument overlying the greater labium. It communicates with the ilioinguinal and with the spermatic plexus of the sympathetic. The crural branch is distributed to the upper ventral thigh region. The lateral cutaneous branch of the lumbosacral plexus, from the first and second lumbar, or second and third, is distributed by two terminal branches. The anterior one supplies the ventrolateral thigh region as far as the knee. The posterior one is distributed over the tensor fasciæ femoris and the inferior gluteal region.

The anterior crural branch of the plexus, together with the obturator and great sciatic, need no description. It is to be kept in mind, however, that the lesser sciatic nerve is a cutaneous nerve and that it supplies sensory fibers to perineum, scrotum, base of penis in the male, labium magnus in the female, and integument between coccyx and greater trochanter, and that it courses downward through the dorsal thigh region to the popliteal and upper calf regions.

Now consider the related sympathetics in order to establish the interrelation between the viscera and the somatic nerve distribution. A few general principles must be laid down, the first being that the direct method of communication between the visceral sympathetics—including gangliated cord, prevertebral, collateral, and terminal ganglia—and the somatic nerves (mixed) is by way of the rami communicantes, both white and gray. This intimacy establishes the communication with the spinal cord through the relation which the sympathetic axons and dendrites bear to the cord.

Secondly, and we can do best by quoting Piersol's text: "The white rami are composed almost exclusively of the visceral branches of certain of the spinal nerves, which use the sympathetic system as the pathway by which they are to arrive at their destination. They consist of fasciculi of medullated fibers derived from both the anterior and posterior roots of the spinal nerves. The fibers arising from the anterior root are called the splanchnic efferent, and those from the posterior root the splanchnic afferent. Not all of the spinal nerves, however, give off white rami, these strands of communication forming a thoracicolumbar group from the first or second thoracic to the second or third lumbar nerve inclusive, and a sacral group derived from the second and third, or third and fourth, sacral nerves. The cervical nerves do not give off white rami. The splanchnic afferents transmit motor impulses to the unstriped muscles of the vessels and viscera, and secretory ones to the glands of the splanchnic area. The splanchnic afferents transmit sensory impulses from the viscera to the spinal cord." Again, "the gray rami are bundles of axones of sympathetic neurones which pass from the gangliated cord to each and all of the spinal nerves."

Thus, it will be comprehended that sympathetic filaments are provided in the somatic nerve distribution.

Now, applying the theory of transmission of pain sense through sympathetic nerves of the viscera, and acceding the interrelation established with somatic distribution, reflex pain areas become not only plausible, but clinically of great import. This interrelation also serves to explain the phenomenon of muscular spasticity.

Clinical observers cite, then, thoracic and abdominal evidences, so far as the skeletal muscles are concerned, in the presence of intrathoracic and intra-abdominal diseases, and a knowledge of anatomy will materially aid in locating the focus of irritation, according to the site of muscular rigidity and tenderness.

3. Clinical Significance of the Autonomic Cerebrospinal Arc.

Stimulation of any special sense nerve or nerve of ordinary sensation in any part of its course, from root to periphery, gives rise solely to peripheral manifestations. Thus, irritation of any part of the optic tract from cortex to retina is manifested in some form of light or color; of the auditory nerve, as some form of sound, and of a sensory nerve as numbness, tingling, burning, or pain in the general sense. These facts are universally employed in a diagnostic sense, and in this sense, then, pain must be looked upon as beneficent, as it directs our attention to a part and at the same time compels rest on the part of the patient. The thoracic and abdominal viscera, however, possess no sensory nerves, nor does the peritoneum, visceral or parietal, though the preperitoneal tissue is richly supplied with sensory filaments. How, then, can we explain the pain of angina pectoris, gastric ulcer, gall-stone, and renal colic; the vague discomfort of an enlarged and congested liver, especially noted in cases of failing right heart; the peculiar sensations attendant upon well-marked visceroptosis; the shoulder pain in gall-bladder disease, in some instances extending down the outer side of the arm; the hypogastric pain of a distended urinary bladder, and perineal and genital pain when fundus irritation exists, as in calculus at the base of the bladder; retention of urine after perineal suture for lacerations, pain in the right inferior quadrant in appendicitis, etc.? Too much time would be consumed in taking each of these up in detail, but they all permit of ready explanation on anatomic grounds, except perhaps the unilateral phenomena of appendicitis. If the organs and parts included in the above category were themselves possessed of sensory filaments, the pain would be limited to the confines of their boundaries. This is manifestly not the case. Note the pain of a gastric ulcer, which is fixed despite the movements of the organ during respiration. Even granting that it may be fixed by adhesions, no such argument can be adduced in the case of shoulder and arm pain in gall-bladder disease or the widespread thoracic arm, and even abdominal pain in angina pectoris.

The viscera are richly supplied with autonomic or sympathetic fibers which are afferent,—or both afferent and efferent in some instances, as in the splanchnics. These enter the cord at various levels and are there in

relation with cerebrospinal nerves, efferent, which emerge at the same levels. Irritation in an autonomic area is, therefore, conveyed to some definite level of the cord, depending on the organ involved; and flowing over to the centers of cerebrospinal nerves, it becomes a visceromotor reflex, expressed clinically as hyperesthesia, hyperalgesia, and muscular rigidity. Hence the extent of peripheral manifestation is not measured by the size nor position of an organ, but by its anatomic associations and the degree of irritation. In no other way could we explain the pain association of such widely removed parts as the kidney and testicle, gall-bladder and shoulder, and retention of urine in perineal suture,—though the latter occurs only when the skin is included in the suture. From the standpoint of diagnosis, this is a topic which deserves painstaking study, for it often sheds light where otherwise nought but darkness would prevail.

4. Sacroiliac Disease and Possible Errors in Diagnosis.

The region of the lumbar and sacral vertebræ, together with the sacroiliac joint and the related structures, merit attention.

It was formerly taught that the sacroiliac joint was a true synchondrosis, but the present view is that the joint, while classed as amphiarthrodial, presents some of the features of a diarthrosis. Thus, while there is to a certain degree interlocking of the sacrum and ilium, there is some motion, and a limited synovial fluid space. Inflammatory disease and traumatism, therefore, do take place. Ventrad to the joint, and in relation with the lumbar vertebræ, is the psoas magnus muscle. This muscle, arising from the front of the bases and lower border of the transverse processes of the lumbar vertebræ, as well as from the lateral aspect of the center of the last thoracic and all the lumbar vertebræ, including the discs, has imbedded in its substance the lumbar portion of the lumbosacral plexus.

Inferoventrad of the joint, behind the psoas, the pyriformis muscle arises from the front of the sacrum and the margin of the great sacrosciatic foramen, and lying upon it is the sacral portion of the lumbosacral plexus. All these related structures receive their innervation from the trunks issuing from the lumbar intervertebral foramina and the anterior sacral foramina. Consequently invasion of the bones, cartilages, and joints by inflammatory diseases, of whatever etiology, is quite likely to produce pain impulses traveling through the nerves of the plexus distribution. Supposed sciatica, then, may be in reality an osteoarthritis, either sacroiliac or lumbosacral. Supposed sciatica may mean in reality sacroiliac joint traumatism. Again, remembering the relation of the lumbosacral plexus on the right side to the appendix, ileocecal valve, and beginning of the colon, and on the left side to the omega loop, one readily appreciates the reason for pain in the presence of disease attacking these viscera. The same holds true in pelvic diseases. In short, complaints of pain in the lumbosacral-plexus distribution call for routine examination of the abdomen and the lumbosacral and sacroiliac regions, including rectal and vaginal examinations and sometimes a study

of sensory changes. The question may be asked, Why is the great sciatic more frequently involved than the other branches? That is answered when one recalls that this nerve is formed from the fourth and fifth lumbar and the first, second, and third sacral nerves.

5. Abdominal Pain in Angina Pectoris.

Cases of angina pectoris, frequently fatal, are often erroneously diagnosed acute indigestion. As an illustration of this fact we wish to present in brief the history of a patient recently under the care of one of us:—

A woman, 61 years of age at the time of her death, which occurred suddenly, was a high-blood-pressure patient, showing usually about 220 to 240 mm. systolic pressure and 115 to 135 diastolic. She had been ailing for about two and one-half years at the time of her demise. The onset of her trouble she dated from a condition which was diagnosed acute indigestion. She had an attack, of sudden onset, characterized by substernal pain with a sense of epigastric distention, nausea, and prostration. She had a number of attacks of very acute and often alarming pulmonary edema, some of which followed anginal attacks similar to that described above. The blood-pressure often fell a little, down to 200 systolic, and much lower on two occasions, after her attacks of angina. This fall did not take place until from two to three days after an attack. She frequently referred to attacks of substernal pain, numbness and aching in the left arm and hand, and to a less extent in the right, as well as to pain in the left side of the neck and in the epigastrium. She spoke of having indigestion whether she ate or not. She was a well-nourished woman, of normal physical conformation except for left ventricular hypertrophy (no valvular lesion), arteriosclerosis, and a moderate degree of interstitial nephritis. After one of the more severe anginal attacks, in which the pain occurred in the precordial and substernal regions, and extended down both arms, the left side of the neck, and over the epigastric region, we noted a rather pronounced hyperesthesia over the chest and the involved abdominal area, with hyperalgesia and rigidity chiefly in the midepigastric area, fading off to the left. The hyperesthesia promptly disappeared, *i.e.*, it was not present the following day, but the pain on deep pressure lasted about two days, and the increased muscle tension faded very gradually after several days; while it lasted it was accompanied by soreness when she attempted to turn in bed. Apart from the angina, she stated that she felt distended, and brought up quantities of gas.

Such cases are far more common in men than women, as one would expect, in view of the far greater occurrence of this disease in males, and especially in men of affairs and large business responsibilities. The part such men play in any community makes it incumbent upon us to recognize the gravity of that symptom-complex, so apt to occur after the fiftieth year, which is often regarded as indigestion.

The pectoral and arm pain of angina pectoris is most frequent, but more disseminated or solitary extrapectoral pain is rarely referred to and more rarely recognized and diagnosed. In some instances all the other features of a typical angina are present, as Heberden observed, but in the absence of these the diagnosis is very difficult. Learad was one of the first to call attention to abdominal pain in angina, and he said that it was often regarded as gastralgia. In 10 of Osler's 268 cases the pain was abdominal.

Osler mentions a case in which the attack began with agonizing pain in the left leg. Pain in the jaw, especially in the front teeth, and increased flow of saliva are not at all uncommon, but pain in one testis has also been reported.

There is absolutely no unanimity of opinion as to the manner in which pain is produced in angina pectoris, and an equal lack of definitive evidence exists as to the character of cardiac disease with which angina is associated. Assuming, however, that some form of cardiac abnormality is responsible, we know that the heart is in relation with the first four thoracic segments of the cord through its autonomic fibers, and also with the three cervical ganglia through the superior, middle, and inferior cervical cardiac branches of the sympathetic. As the carotid and cavernous ganglia are merely prolongations of the cervical, it at once becomes manifest that in this way, too, the heart is connected through the sympathetic with the cervical cord segments and the cranial nerves. Thus, it becomes apparent that through the relation between the sympathetic system and the cervical and upper four thoracic cord segments, as well as between the cranial sympathetic nerves and ganglia and the cranial nerves, various sensory, motor, and secretory manifestations are brought about in the head, face, and neck and the substernal, shoulder, and arm regions.

But this does not explain epigastric phenomena, and still less testicular and leg pains. The vagus supplies the heart, and also the stomach, and as it is both efferent and afferent, and its gastric fibers are in relation with the eighth and ninth thoracic segments, and these latter are distributed to the epigastric area, it is conceivable that this constitutes the reflex arc involved. This does not suffice, however, in the case of leg and testicular pain. The twelfth thoracic and the lumbosacral cord preside over these regions.

It has occurred to us, therefore, that the variable cardiac conditions found at necropsy in cases of angina pectoris, the constancy of arterial degeneration, notably of the aorta, and the fact that a rich plexus of autonomic fibers surrounds the aorta throughout its entire length, and that these fibers are in relation with the cord segments at every level, render it probable (1) that the aorta is the pathogenic factor in angina, and (2) that the pain in any region of the body depends upon the part especially involved and its autonomic cerebrospinal association.

Additional detailed anatomic associations might be cited, with illustrative cases, but this would not be permissible in the limits of a paper which aims rather to present thoughts for reflection than a mass of clinical and anatomic data.

NOTE ON THE ADMINISTRATION OF DIGITALIC ACID, THE ACID RESIN OF DIGITALIS PURPUREA.*

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Several acids have been isolated from foxglove, but they have not been studied in medicine and so far have been merely given a name and briefly described by their discoverers.

Among these bodies is digitalic acid, a fat acid obtained by Kosmann[1] in making his digitalin. It is a white, crystalline substance. It possesses an acid taste, a peculiar rancid odor, and is soluble in water, alcohol, and slightly in ether. It readily decomposes in the air, turning to a brown color. The writer isolated and identified the active principle of digitalis as the acid resin, a constituent essential, but of varying quantity.[2] To give the acid resin its proper name it was necessary to select that of digitalic acid, thereby disregarding the prior claim of Morin to the word. The title of the former investigator designated a chemical compound of uncertain origin and which has until now remained obscure and seems to be devoid of activity. The digitalis effects of digitalic acid are very prompt and precise. They are not marred or destroyed when very large doses are given; neither are toxic effects of acute digitalis poisoning, such as headache, faintness, vomiting, and purging—cumulative action—with sudden and dangerous symptoms of collapse, produced.

Digitalic acid can be given as a pill or tablet of the impure or purified resin. As extracted it is contaminated with the digitalin of Nativelle or digitoxin. The quantity of this contaminating glucosid is but small. The action of the pure resin is identical or perhaps more speedy. The dose of either form is from $\frac{1}{32}$ to $\frac{1}{16}$ grain once each day. As much as $\frac{1}{4}$ grain *per diem* has not produced untoward effects or poisonous disturbance. This largest dose does not result in any more marked digitalis action than the smallest of these quantities.

Digitalate of sodium may be given in the same amount, $\frac{1}{32}$ to $\frac{1}{16}$ grain, once or twice a day. It is useful in a tablet, pill, solution, and, best of all, for hypodermic injection. The digitalate when swallowed begins to influence the cardiac contractions and the circulation within an hour. The effect lasts one, two, or three days.

Hypodermic injections are given once a day. In the gravest cases and in the moribund a second injection is given in twelve hours. The injection is painful to those of normal subcutaneous sensibility, but the smarting is

* Read at a meeting of the Therapeutic Society of Washington, D. C., February 7, 1914.

[1] M. Homolle: Mémoire sur la Digitale pourprée, Paris, 1845.

[2] A memoir on this subject appeared in the Interstate Medical Journal, December, 1913.

of a few minutes' duration only. In all serious stages of disease the pain passes unperceived. Induration or local inflammation never results. The digitalis action is apparent in the pulse and heart sounds within fifteen to thirty minutes after the injection. As in administration of the acid by the mouth, the larger doses injected do not produce cardiac effects any more powerful than the smaller ones. Digitalic acid, however given, exerts a full digitalis action in twenty-four to forty-eight hours, viz., slows the ventricular contraction and the respiration, increases the general muscle tone and vigor, and increases the urinary secretion. It raises the blood-pressure.

In cardiac therapy it is necessary to use remedies for months and years, and urgent or sporadic administration is essential only in those severe acute conditions in which life is directly menaced. Hence hypodermic injection must be limited entirely to these occurrences; and in all other cases where a heart with a failing or fallen compensation is to be sustained or uplifted, perfect treatment involves the taking of the remedy for many months. This is also the proper plan for the minor states of heart weakness, such as those associated with chronic headache, cephalic neuralgias, chronic urticaria, chronic bronchitis and asthma, congenital small heart and the symptoms arising therefrom, as well as beginning or moderate cardiac dilatation from affections of the heart valves and myocardium.

For prolonged use digitalic acid is the best form in which foxglove can be given. It never produces those disturbing symptoms which make it absolutely necessary to suspend the use of the leaf or to discontinue it altogether. When digitalis begins to act as an irritant poison, with associated headache, vertigo, vomiting, and purging, digitalic acid can be immediately substituted, recession of these symptoms taking place forthwith. It is evident, therefore, that the acid resin does not produce the poisoning peculiar to digitalis or its principal glucosid, whether this poisoning results from an overdose, or, as is occasionally the case, intolerance is immediately evident from any dose. The following cases will illustrate these differences as noted in practice:—

Case 1. Single female, 35 years, short and frail. Weight 90 pounds, never varies. Retroflexion with sacral pain. Has hay fever and hay asthma annually. Lungs healthy; heart valves intact, heart action regular, impulse diffused, probably prone to dilate from the asthma or exercise. A weak heart in a frail body, without special lesion. For years, from exhaustion, worry, excitement, and late hours, she has experienced a throbbing headache on awakening in the morning, often confining her to bed for a day or two. Does not vomit, but cannot take food. The headache is very severe. No defect of eyesight. This headache is not a migraine, but one of exhaustion from a weak or weakened heart. Digitalis produces nausea and vomiting and she refuses to take it again. She is then given the digitalis resin, which receives her earnest approval, and she asks for more. The headache is absent as long as the resin is taken.

Case 2. Single female, 45 years, medium height, weight 165 pounds. Neurotic and emotional, a hard-worked pension agent's clerk. Marked dyspnea on walking; heart dilated, probably after idiopathic hypertrophy; valves intact, normal sounds accentuated. For twenty years a martyr from headaches over eyebrows and vertex. Facial neuralgias, first and second divisions of the fifth. Rest through early retiring at night, and salines, reduced the weight 30 pounds. Digitalis resin practically cured both the headache and the neuralgia.

Case 3. Married female, 5 feet tall, weight 110 pounds, frail and anemic. Tuberculous antecedents. In her only confinement, excessive hemorrhage. Since then for nine years has been semi-invalid from physical weakness. Liable to syncope. Any effort at housework exhausts her. No hysteria. Pulse very weak, heart sounds and impulse faint, valves intact. Area of heart dullness not increased. Probably fatty degeneration from puerperal hemorrhage. No rheumatism or septicemia. Is given 1 grain of digitalis leaf; and as a result of the nausea and increased faintness it produces, absents herself from further treatment for a long time. It is again resumed when she is confined to her bed for several days following the exertions of moving into a new house. She is then given the resin, which she takes without inconvenience. Heart tones and pulse show increased force.

Case 4. Single girl, 18 years, 5 feet 2 inches, weight 154 pounds. Of fatty habitus; pale, puffy skin; swollen lips, acne vulgaris of face, slight enlargement of superficial lymphatics, scrofulous blepharitis. Breathless on exertion, heart sounds normal. Status lymphaticus. One-half grain of digitalis leaf with carbonate of iron, two or three times a day, invariably causes prompt and persistent nausea, occasionally vomiting. She took instead the resin for two months, without any disturbance and with considerable improvement in the lymphatic appearance.

Case 5. A woman of 47, general health good, last menstruated two years before. Of late has been disturbed by rapid, strong, and irregular heart beats, more often at night, combined with a feeling of discomfort in the chest. These abnormal sensations have made her apprehensive of danger to her health, although she is deliberate, resolute, and free from timidity or hysteria. The heart sounds are normal, the size and position of the muscle not changed. The apex impulse is strong. This disorder is apparently one of function due to altered glandular activity accompanying the change of life. She is given a 2-grain capsule of digitalis powder, to be taken after breakfast or lunch. As a result she experienced a very pronounced nausea each afternoon, compelling her to remain in bed for the rest of the day. She persisted, however, in taking a capsule each morning and retiring with severe nausea later on each day. This cycle was repeated five times. As her description of the disturbance was both direct and clear, it was plain that the irritation of the stomach was caused by the digitalis powder. She was therefore given in its stead a tablet of the resin of digitalis, $\frac{1}{33}$ grain, after breakfast each day. The heart irregularity ceased and there was no further return of the nausea.

Case 6. Female, married, 45 years, height 5 feet 2 inches, 4 children, weight 145 pounds. Menopause. Is pale habitually. On walking or exertion, breathing oppressed. Liable to muscular rheumatic pains in limbs from fatigue. Is erotic, pudendal pruritus, masturbation very probable. Heart sounds faint, heart dullness increased to left, apex beat feeble, aortic stenosis. After taking for a few days digitalis leaf, 1 grain twice a day, is seized very suddenly with vertigo, nausea and vomiting, and diarrhea. Confined to bed. Plainly digitalis poisoning. Is given instead the resin, which is begun the same day. Under its effects the dyspnea and muscle pains cease. Attempt to reduce the weight by diet and salines not successful.

Case 7. A little woman of 65, married, sterile, an industrious housewife. Many years of good health. For the past two years, failing compensation; aortic regurgitation with stenosis; hypertrophied ventricles dilated. Second pulmonic sound sharp, very strong, and hard, throbbing arteries. Dyspnea on mounting stairs and edema of lower limbs. Took for a long time with benefit powdered digitalis in a small daily dose. With this the swollen limbs returned to normal size. Breathing again easy. Under its use yellow vision occurred. The digitalis resin was then given instead. This she has taken for seventeen or eighteen months. Prefers the resin to the powder, because it seems to act more surely and quickly and because the yellow vision alarmed her.

Case 8. Female, 70 years, many children, much housework. Incipient senile dementia. Cannot rest, must work; is forgetful, wanders about at night. Has frequent attacks of cardiac asthma at night. Considerable edema of lower limbs of long duration.

Urine free of albumen. Double aortic murmur from atheroma. Pulse very irregular; likewise heart contractions; apex beat varies from strong to feeble. Fibroid myocarditis; no angina pectoris. The patient refuses to submit to any treatment by rest. Is given daily 1½ grains of powdered digitalis, which, producing after a short time nausea and vomiting, and not altering the difficult breathing or swollen limbs, is rejected by her as harmful. The resin of digitalis is then exhibited. The cardiac asthma disappears, the dropsy likewise. The patient holds the remedy in high esteem.

Case 9. Merchant, 40, short, well nourished. For some years tires easily. Mental lassitude, aching rheumatic pains in muscles of limbs, worn out each afternoon, insomnia, appetite moderate, complexion sallow, looks worn. No history of rheumatism or febrile infectious disease. Used tobacco freely. Pulse weak, small, 60-64, no arrhythmia; cardiac dullness not increased; no murmurs; heart sounds very faint. Excluding pericarditis and its sequels, diagnosis: Beginning fibroid myocarditis. One grain of digitalis with iron carbonate twice a day. After three or four days, suddenly nausea, vomiting, and diarrhea. He became so faint and weak that he went to bed forthwith. Patient concurs in the opinion that this sudden attack was due to the medicine. The next day he began a daily dose of the resin, which he continued without an omission for eight months. The lassitude of his incipient myocarditis was arrested.

(*To be concluded in the May issue.*)

Cyclopedia of Current General Literature

Acetonuria, Testing for.—In diabetes acetone begins to appear in the urine particularly when the patient cuts down his carbohydrate food. In the milder forms, where 100 Gm. of starch may be consumed without production of glycosuria, the urine is, of course, free of acetone. But in the medium or severe grades of diabetes, the urine is never either sugar-free or acetone-free at the same time. Care in the selection of the diet, alkaline treatment, and consumption of antiketogenetic substances may limit acetone production somewhat, but, practically, this may be disregarded. Therein lies the importance of the acetone test. In some cases a rigid diet renders the urine sugar-free, but acetone is always present.

Neither Legal's, Chautard's, nor the iodoform test will detect small quantities of acetone when performed with urine without distillation. After distilling, the iodoform test (Lieben's) is very satisfactory, provided the detection is made by examining microscopically for crystals in form of hexagonal plates or small stars rather than by the odor of iodoform. This test, although reliable, is time-consuming, and the author, therefore, prefers Frommer's test, which may be applied to the urine direct. This test is described by Rosenbloom as follows: About 10 c.c. of urine are treated with about 1 Gm. of sodium hydroxide in substance, and, without waiting for it to dissolve, 10 or 12 drops of a 10 per cent. solution of salicylaldehyde in absolute alcohol are added. The mixture is heated to 70° C. In the presence of acetone a marked purple-red color develops at the zone of contact with the alkali. This test can indicate the presence of 0.000001 Gm. acetone in 8 c.c. of water (Frommer).

Unless the urine is diluted so that its specific gravity is reduced to about 1.010, confusing colors occur that render interpretation difficult. When it is properly diluted, however, urine containing only minute or normal quantities of acetone will give after ten or fifteen minutes' standing a straw or faintly pink color. Checked against the iodoform test, the Frommer reaction was found by the author very reliable. William Muhlberg (Medical Record, December 27, 1913).

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Brachial Birth Palsy.—Careful palpation of the region of the fifth, sixth, and seventh transverse processes invariably makes out, in these cases, a characteristic induration, which varies with the severity of the lesion and is always sensitive to pressure. The examiner should approach the sitting child from the rear and palpate both sides of the neck at the same time to compare the normal with the damaged side. This induration seems to be less marked in those cases where the roots have apparently been pulled from the cord.

Most textbooks give an optimistic prognosis in brachial birth palsy. As a matter of fact, in all cases (except where the entire plexus has been ruptured) spontaneous improvement appears after an interval of three to twelve weeks after birth and continues slowly until the child is about two years old. After this time improvement ceases and there appear increasing deformity and interference with function. Complete spontaneous recovery is rare, occurs only in mild cases, is complete usually by the end of three months, and almost never later than six months. In the vast majority of cases there will be a permanent defect. In every case where there is considerable paralysis and where no improvement begins within the first few weeks there is certain to be some degree of permanent injury to the roots.

Surgery holds out the best hope in most instances. Nerve regeneration being most active in young infants, the sooner a divided nerve is sutured end to end, the better the prospect of a satisfactory result. Operation should be undertaken at the earliest feasible moment considering the general condition and the local resistance of the individual child. Under these circumstances the choice of time for operative interference may vary from two weeks to three months. In these operations the chief risk lies in the anesthetic, as the wound goes only through skin and fatty tissues. The shock is negligible.

In all these cases the best primary treatment is to keep the injured extremity at rest for at least two weeks. This might be done with an ordinary triangular sling so arranged as to derive all its support from the sound shoulder and to cause marked elevation of the shoulder on the damaged side. At the end of two weeks the sling may be removed daily and gentle massage given, always with care not to pull the shoulder away from the head and neck, as this would again stretch the damaged nerves. At the end of three weeks decision should be made for or against operative exploration.

In cases where a root or roots have been torn from the cord they must be anastomosed at operation into a neighboring root, with the hope of getting a distribution of power. In all cases, when the nerve sutures are

placed, the head, neck, and shoulder are to be approximated. This position must be maintained without a moment's relaxation for from three to twelve weeks from the time of operation. A steel brace was devised by the author which serves the purpose without undue discomfort to the patient. It is made of a flat steel rod appropriately bent and supplied with supports for the forearm and shoulder. A muslin cap is fitted to the child's head, which prevents the head from protruding upward too far through the brace. The shoulder pad, which overlies the scapula of the damaged extremity, is fastened by a broad adhesive strap which passes from the pad obliquely downward over the child's back. The forearm and arm are bandaged to the brace.

The after-treatment starts with the removal of the brace, and at first should consist of massage and passive motion applied to hand, forearm, and arm. For an interval of four to six months after the operation, manipulation about the base of the neck and shoulder should be very cautious. After time has elapsed for absolutely firm union to occur in the sutured roots, manipulations about the shoulder should be more vigorous. As the evidences of nerve regeneration appear the child must be educated to use the muscles in gymnastic exercises, games, workshop methods, etc.

Surgical repair of the damaged nerve roots causes a degree of improvement which can be attained by no other method. A. S. Taylor (American Journal of the Medical Sciences, December, 1913).

Carcinoma, the Cardiac Sign in.—The cardiac sign in carcinoma is a remarkable diminution of the area of cardiac dullness in the recumbent posture as determined by digital percussion. The dullness begins above about the fourth or fifth costal cartilage, has its right edge about ½ or 1 inch to the left of the midsternal line, and measures across less than 2 inches at the level of the fifth costal cartilage. Often it measures less than 1 inch across, and sometimes there is no cardiac dullness at all. Often the dullness, though narrow in the recumbent posture, is normally or even abnormally broad in the erect.

Certain limitations exist to the significance of the sign. Thus when any cause is present tending, like ordinary emphysema, to reduce the area of cardiac dullness, then a very small dullness naturally conveys no special meaning. On the other hand, when there is a well-known cause of enlargement of heart dullness, such as albuminuria, valvular heart disease, pericarditis, or retraction of lung from phthisis or past pleurisy, then the absence of the sign is equally without significance. Moreover, where the heart is displaced considerably upward the absence of the sign is unreliable. Yet allowing for these limitations, a large number of cases remain in which its help is of value.

Of a total of 111 cancerous cases 97 (87 per cent.) gave the sign, whereas of a total of 107 non-cancerous cases only 18 (16 per cent.) gave it. In 50 cases definitely doubtful as to cancer examined, the cardiac sign proved wrong only in 6 per cent.

It has been suggested that the sign

is no more than a corroboration of marked wasting. This is not true, for in non-cancerous wasting, even when extreme, the sign is rarely found; in carcinomatous wasting, even when marked, it is sometimes absent; in cancerous cases which have not wasted at all it is sometimes present, and the diminution of the dullness in cancer cases is not proportional to the wasting.

When the sign is present in a case of possible carcinoma, the diagnosis of carcinoma should be rejected only after careful consideration. In what must be, if carcinoma at all, a late case of it, the absence of the test strengthens considerably the hope of the absence of carcinoma. Cases are accumulating in which the sign appeared early enough to enable a successful resection to be carried out. W. Gordon (Bristol Medico-Chirurgical Journal, March, 1914).

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Chronic Arthritis, Treatment of.—Injections of phenol-camphor in chronic arthritis must be made only into the joint, never directly into the blood-stream or the spongy portion of the bone. The formula the author now uses is 30 parts of phenol, 10 parts of camphor, and 30 parts of alcohol, and he injects only 0.5 or 0.25 c.c. at one point; 2 c.c. are necessary, however, for streptococcus processes. By using small doses and refraining from applying the method to the smaller joints, there need be no fear of toxic effects from the phenol-camphor. F. Pohl (Zentralblatt für Chirurgie, January 31, 1914).

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Dysmenorrhea, Treatment of.—Atropine found very useful to overcome a tendency to painful menstruation. It probably exerts a relaxing influence when the autonomic nervous system is in a state of hypertonicity. The pronounced spasticity from vagal overstimulation causes pain at menstruation, and atropine wards this off or cures it. In a certain proportion of the cases in which the drug seemed ineffectual, all had one feature in common, viz., an unusually high blood-pressure. The author now tests the blood-pressure as a routine measure before giving the atropine; if it is within normal range, one can count confidently on the desired response to atropine. If it is abnormally high, there is no use in giving atropine; treatment must be directed to reducing the blood-pressure, and the cause sought and removed. This cause is frequently found in the pelvis—a tumor or inflammation in one of the genital organs, or chronic constipation causing local disturbance in circulation. When the cause is removed the blood-pressure becomes normal and the dysmenorrhea either ceases or then becomes amenable to atropine. L. Stolper (Wiener klinische Wochenschrift, January 15, 1914).

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Epilepsy, New Treatment of.—Four patients were treated with subcutaneous injections of cerebrospinal fluid, taken for each from another epileptic, and were benefited considerably. The dose of fluid injected was 3 to 5 c.c., at biweekly or weekly intervals. The direct effect of the procedure was unmistakable, for the reason that prior to this treatment for months and years the patients had received uninterruptedly large doses of bromides and other drugs, with little or no relief. The improvement

after the administration of the cerebrospinal fluid was striking not only with reference to the severity of the individual attacks, but also their frequency. In some of the cases the nature of the attacks changed: Petit mal took the place of grand mal. The mental hebetude following the epileptic seizures became exceedingly slight. While spinal punctures with removal of cerebrospinal fluid have been reported as alone yielding a beneficial effect in epilepsy, this objection is removed by the fact that, while in the author's 3 male patients the spinal canal was punctured, the fourth patient, a girl of 11 years, had no spinal puncture, and the results were just as satisfactory. The greatest amount of improvement was noticed especially if the injected fluid was taken from other patients during recurrent attacks, no matter how slight the latter may have been. Each of the 4 patients had presented the most serious type of essential epilepsy. Alfred Gordon (New York Medical Journal, January 17, 1914).

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Leucocytosis in Mental Disease.—Cases of acute confusional insanity present a fairly well marked blood-picture, viz., a polynucleosis and eosinophilia. Cases of manic-depressive insanity and dementia præcox show variations in the leucocytic formula resembling the preceding, but not so well marked nor so constant. Continuous polynucleosis and eosinophilia point toward recovery, and absence of polynucleosis and hypoeosinophilia points toward chronicity. Recovery may be hastened by stimulation of the leucocytes by terebene (1 c.c. injected subcutaneously in the flank).

The remission stages of general paralysis are characterized by lymphocytosis, and seizures by polynucleosis. Remissions in general paralysis may be prolonged by suitable doses of tuberculin ($\frac{1}{1000}$ to $\frac{1}{5000}$ mg. of tuberculin residue).

Cases of delusional insanity and terminal dementia do not exhibit a leucocytosis.

Epileptics show a polynucleosis in their preparoxysmal condition, and a diminution in the leucocytes in their interparoxysmal state. D. J. Jackson (Journal of Mental Science, January, 1914).

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Lupus Vulgaris, Treatment of.—Gold and potassium cyanide was injected intravenously in 12 cases of lupus vulgaris. The single dose was 0.01 to 0.05 Gm. The results were good. A course of 12 to 14 injections was followed by an interval of two to three weeks, after which another treatment was given. Even in severe cases the therapeutic results were better than are obtained with tuberculin and other measures. F. V. Poor (Deutsche medizinische Wochenschrift, November 20, 1913).

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Metallic Poisons and the Nervous System.—A wide variation exists in individual susceptibility to all metallic poisons. In those susceptible, if the nervous system is attacked, the peripheral nervous system is the most vulnerable, and more especially the extensor supplies. There is with lead poisoning, in all probability, an early lymphocytosis of the cerebrospinal fluid, probably coincident with, or succeeding upon, the basophilic granulation of the red blood-cells. Non-inflammatory degenerations of

any portion of the peripheral system should suggest the metals as a possible cause. In the absence of skin evidences of arsenic and the blue line of lead, the urine and the blood should be examined, and, finally, artificial abscesses may be induced and examined for the metals. A positive Wassermann reaction does not seem to exclude metallic poisoning, especially by lead, in favor of syphilis in primary nerve or tract degenerations. The source of the poison may not be detectable until long after the presence of the metal as a cause has been established.

In the treatment iodides are used because of their effect in increasing the solubility of the metals in the blood, but Gowers cautions against a too free use of iodine, since the influence of the metals upon nerve structures is exerted largely through the blood, and the throwing of a large quantity of metal suddenly into the circulation may aggravate the symptoms. Magnesium sulphate has long been a favorite eliminant. Calcium permanganate (¼ grain t. i. d.) is recorded to be of value by Stephens. The fixation abscess induced by v. Hinze by subcutaneous injections of 1 c.c. of turpentine has resulted in marked improvement; 0.089 per cent. of metallic lead was recovered in 1.528 Gm. of pus from an abscess by v. Hinze. G. A. Moleen (American Journal of the Medical Sciences, December, 1913).

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Oil-ether Anesthesia.—The fact that the only apparatus needed is a small catheter and a funnel into which to pour the mixture is a strong argument in favor of this method. To a practitioner compelled to work alone, the method would be of inestimable benefit. On account of the gradual and equal absorption of the ether from the colon, and also on account of its rapid evaporation from the lungs, it appears to be at least a comparatively safe anesthesia. Mucus and saliva are absent, and the patient's lungs and stomach are spared. An advantage of oil-ether anesthesia is that it may be administered, if necessary, without the slightest exposure of the patient, the tube being introduced between two suitably adjusted sheets. The patient lies on the left side in perfect comfort, in marked contrast to the disagreeable supine position required for inhalation anesthesia. The preparation of the patient should be the same as for ether-vapor anesthesia by rectum. This is most important and is as follows:—

A cathartic of castor oil should be given the night preceding the operation and followed in the morning by warm-water enemas one hour apart until the return is clear. The patient should then be allowed to rest for two to three hours. One hour before the introduction of the mixture, a solution of 5 to 20 grains of chloretone dissolved in 4 drams of ether and mixed with an equal amount of olive oil is given per rectum. Thirty minutes later $\frac{1}{12}$ to ¼ grain of morphine with $\frac{1}{200}$ to $\frac{1}{100}$ grain of atropine is given hypodermically. Twenty minutes after the administration of the hypodermic injection, the oil-ether mixture should be given slowly (at least five minutes) with the patient in the Sims position. The preliminary medication, and the percentage and amount of the mixture (roughly, 1 ounce to every 20

pounds of body weight) vary with the age, size, and general condition of the patient. A 50 to 65 per cent. solution is sufficient for children and weak, anemic adults, while a 75 per cent. solution is usual with normal adults and should never be exceeded.

The patient should be kept perfectly quiet, not being permitted to talk, and about twenty minutes allowed for the anesthetic to take effect before the patient is moved. Eight ounces of the 75 per cent. mixture will last from two and a half to three hours. If the operation is completed before this time, two small rectal tubes are inserted and as much of the mixture drawn off as possible. Cold-water soapsuds are now injected into one tube and drawn off through the other and one rectal tube then withdrawn. Two to 4 ounces of olive oil are now introduced in the rectum, followed by 1 pint to 1 quart of water, and the second tube withdrawn. The patient recovers consciousness fifteen to thirty minutes later.

By this method the ether is obliged to pass through the lungs before reaching the brain. Consequently a loss is sustained unless a small bag for rebreathing is placed over the face. A large sterile paper bag placed over the face and head, and held in place by a rubber band, answers all purposes.

In the author's cases from 200 to 300 c.c. of a mixture of 3 parts of ether to 1 part of oil seemed to be about the right amount.

The resulting anesthesia is ideal—pulse and respiration normal, no mucous râles, and no after-effects, as regards either nausea or diarrhea. In half of the total number of over 200 cases a supplementary inhalation anesthetic was used, the oil-ether anesthesia proving too light. J. T. Gwathmey (New York Medical Journal, January 31, 1914).

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Pneumonia, Vaccine Treatment of.—The keynote of the treatment of pneumonia by vaccines is early administration. It is not a method suited for late, desperate cases. If vaccine is given early the body is stimulated to produce an excess of opsonins and antibodies; the leucocytes are probably already adequate, or the vaccine will help make them so, and the pneumococci can be killed before they reach such numbers that in their destruction amounts of endotoxins are set free that will greatly injure the heart, kidneys, nervous tissues, etc., before they are neutralized or excreted.

The writer has had a number of cases where the vaccine was given within a few hours of the initial chill and, though the diagnosis was beyond question, the whole process was over in forty-eight or seventy-two hours. In such cases a real pneumonia does not have time to develop to the stage of consolidation, for the body is able to kill the invading pneumococci without being forced back to her last line of defense—the production of a pneumonic process in the lung, which, in so many cases, fails of its purpose, the victim being destroyed in the attempt.

The best method of procedure (though all observers do not agree to this) is to administer a polyvalent stock vaccine of the pneumococcus and streptococcus, of each, 30 million, at as early a time as possible. Make sputum smears and cultures, blood-

cultures in early cases, lung puncture in late ones, and proceed to the preparation of an autogenous vaccine. If there is no definite response in twenty-four or forty-eight hours, repeat, or preferably give an autogenous vaccine. If there is no response in thirty-six or forty-eight hours, double the dose. If there is a response, as evidenced by improved clinical symptoms and signs, increased well-being of the patient, etc., defer reinoculation three days, or until the first symptoms of retrogression in the general condition or the physical signs occur. Maintain the dosage or increase it every two or three days until the patient is entirely well. Generally about three doses are necessary.

The results are certainly an improvement on all other methods of treatment. Hundreds of cases have been reported, with an average mortality of 5 to 10 per cent. The mortality from the old routine treatment is still 16 to 20 per cent., and in alcoholic cases nearly 50 per cent. in some epidemics. In 20 consecutive cases seen by the writer in private practice there was but one death. In hospital practice, as a rule, pneumonia is well developed before one sees the cases. In altogether over 100 cases so treated the author observed that the disease runs a shorter course, the patients are less toxic, there is less fever, and generally no delirium occurs except in alcoholic cases. Convalescence also is shortened and the danger of complications is lessened.

One should remember in pneumonia the advice of Wright to give citric acid in severe cases of infection. Twenty to 30 grains may be given every two to three hours. Henry A. Craig (Medical Record, December 27, 1913).

* * *

Pulmonary Tuberculosis, Acromial Breathing in the Diagnosis of.—The author reports further experience in the application of Abrahams' finding that, in apical tuberculosis, auscultation at the acromion process increases and amplifies all the auscultatory signs ordinarily obtained over the apices. In practising this method of examination the hard-rubber bell of the stethoscope is placed over the acromion process of the scapula, where it joins the acromial end of the clavicle. In thin people this joint is not well covered with muscle and it is sometimes hard to place the bell of the stethoscope in such a manner as to exclude all external sounds. This difficulty, however, can be overcome by pinching the skin up so that the bone fills the bell of the stethoscope; the surrounding folds of the skin act as a barrier to foreign sounds. Joint creakings, which are sometimes heard, are easily distinguished from râles. The value of this method is best appreciated if the apices are examined first, next the acromion, and then the difference in the sounds compared.

Among 52 cases, consisting of 28 in the first stage, 14 in the second, and 10 in the third, acromial breathing was found present in all the first-stage cases, in 8 of the second, and in 2 of the third. It would seem that it is a valuable method in the first-stage cases; and since that stage is the most important from a diagnostic point of view, and as the method is so easily acquired, it should be universally em-

ployed. N. Magida (New York Medical Journal, December 27, 1913).

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Skin Diseases, Carbon-dioxide Snow in Treatment of.—In two years' experience the writer has treated with carbon-dioxide snow 179 cases, of which 84 were of lupus erythematosus, 7 rosacea, 55 various kinds of nevi, 14 verrucæ, 8 carcinomata, and 100 various other skin lesions.

Of the 84 cases of lupus erythematosus, 10 were cured outright, 21 almost cured, 10 result unknown, and all the other cases markedly improved. Twelve seconds under fairly firm pressure was the average time of application, though places like the concha auris and the lips were subjected to less. Results with the papular types of rosacea on nose and chin were excellent. The author is careful to warn against anything but minimal pressure—average time six to seven seconds, and maximum ten seconds—and agrees with Morris and Low on the utility of the procedure. The 55 nevi showed variable results, especially the flat vascular types. On the whole, he is inclined to think that nevi do not yield to carbon-dioxide snow so well as to other methods of treatment. He prefers light or radium treatment for the common port-wine stains, and the galvanocautery for the stellate type. Cavernous angioma, on the other hand, yielded excellent cosmetic results (6 cases) in fifteen to twenty sittings. The verrucose types are favorably influenced. Common warts are an absolute indication for carbon dioxide, but those of the juvenile type are often too numerous. Such are best treated with a single X-ray application.

In the treatment of small epitheliomata the author has seen no reason for giving up either radium or X-rays, and in none of his 8 cases did he use carbon dioxide exclusively. In certain precancerous conditions, such as hyperkeratotic infiltrations or pedunculated verrucose tumors, the snow was used with complete success, and senile warts yielded at once to single applications.

In lupus vulgaris the results are not at all encouraging, and it is only in the hypertrophic verrucose types that the author recommends it. A similar lack of permanent results was noted in psoriasis. Haslund (Archiv für Dermatologie und Syphilis, vol. cxviii, No. 1, 1913).

* * *

Stretching the Pylorus. — The author reports 21 cases in which pylorus stretching was practised with good result. The total number of stretchings in these cases was 100. He enumerates the following indications for the procedure:—

1. It can be performed with advantage in all cases of pylorospasm, provided there is no fresh active ulcer in the pylorus or its immediate vicinity. If a fresh ulcer in this region is present, as evidenced by the thread test, a course of treatment should first be undertaken toward the cure of the ulcer. As soon as the thread test becomes negative, careful stretching of the pylorus can be undertaken. If, however, the ulcer shows no tendency to heal, or if there are frequent recurrences indicating exacerbations of the ulcerative processes, an operation is indicated.

2. Beginning benign stenosis of the pylorus forms a large field for the treatment by stretching, with the

same exceptions as already mentioned.

3. Advanced benign strictures of the pylorus, which cannot be operated on account of great underlying danger due to heart lesions, kidney or liver complications, or advanced old age, or when the patient absolutely refuses surgical intervention, can likewise be subjected to the internal stretching. In this group the usual pyloric dilator frequently fails to pass, while the dilating catheter over the thread is still able occasionally to enter the pylorus.

Stretching of the pylorus is not antagonistic to surgical treatment. It works hand in hand with it. Where one procedure fails or is not feasible, the other steps in as its helpmate. Max Einhorn (American Journal of the Medical Sciences, December, 1913).

* * *

Syphilis, Salvarsan and Neosalvarsan in.—Healing is as prompt and certain after neosalvarsan as after salvarsan, whether the disease be primary, secondary, or tertiary. If a given lesion fails to heal under repeated injections of either, it is in all probability non-specific.

The combined method with mercury should be used with either drug in all stages of syphilis. Nearly 20 per cent. more of permanently negative Wassermann and luetin results were obtained in all stages with salvarsan than with neosalvarsan. Five doses of neosalvarsan appear to be required against four of salvarsan to obtain the same end-results.

Twenty per cent. of cases under salvarsan show reactions of some kind, against 8 per cent. under neosalvarsan,—though twice as many of the latter are of the severe toxic type than is the case with the former. There is less thrombosis and less inflammation in the tissues following leakage from neosalvarsan than from salvarsan. Apparently one injection of either the old or the new is insufficient, proving effective only in cases preceded or followed by mercury. The efficiency of both increases with the frequency of repetition of the dose. H. H. Whitehouse and A. S. Clark (Journal of Cutaneous Diseases; Old Dominion Journal of Medicine and Surgery, January, 1914).

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Tonsillar Treatment.—The simplest form of *acute tonsillitis* due to infection or a cold is easily subdued in the following manner: Spray the throat, while the tongue is depressed and the breath held for a moment, with the Dobell-Pynchon antiseptic solution:—

℞ Pulveris sodii boratis (C. P.),
Pulveris sodii bicarbonatis (C. P.),
āā gr. xxx (2 Gm.).
Thymolis, ʒij (8 Gm.).
Glycerini, ʒvj (24 c.c.).
Aquæ, q. s. ad Oj (500 c.c.).
M.

Then apply a 3 per cent. solution of silver nitrate by means of a curved cotton holder. Follow with a spray of a 3 per cent. solution of camphormenthol. The cotton carrier is best made of aluminum, with a rather attenuated point so as to penetrate the crypts. The rest of the carrier should be firm enough to prevent bending as it is pressed into the depressions. In spraying the tonsils, with an atomizer having a curved tip directed toward the crypts, sufficient air pressure

(about 15 pounds) should be employed to drive the spray well into the lacunæ so as to evacuate all retained secretions or concretions. The patient should not be directed to sound the syllable, ah, while the throat is sprayed. The expired column of air would tend to eject the spray from the patient's throat and into the physician's face and over his clothing.

In *rheumatic tonsillitis* the detergent solutions used in simple tonsillitis are also applicable. After these, guaiacol renders excellent service. The pure drug, applied to the tonsil on a cotton carrier, may prove painful; in this event it should be diluted with an equal part of glycerin. Constitutional treatment should be instituted at once with such remedies as sodium salicylate, phenyl salicylate, and antipyrin. The latter remedy is useful in doses of 5 or 10 grains every three or four hours, particularly in relieving pain. The other two, in 10-grain doses, have proven efficacious in preventing the formation of abscesses.

In *ulcerative tonsillitis,* after thoroughly washing the surfaces and crypts of the organ, a 10 per cent. solution of silver nitrate should be applied over the ulcerated surfaces and carried down into the crypts as well. Following this, thymol iodide should be dusted with the powder blower over the gland and thrown into the diseased lacunæ. Ulcerative tonsillitis occasionally follows cauterization of the turbinated bodies. For this reason, the nasal cavities should be examined for diseased foci, and treated if any are found.

Where the tonsils are the seat of recurring inflammation, but the patient objects to operative removal, they can be rendered innocuous by means of the electric cautery employed as follows: Selecting 3 or 4 crypts at a time, a 10 per cent. solution of cocaine is applied to the interior of each by means of a fine-pointed cotton applicator, great pains being taken to prevent any of the solution from escaping to other parts of the throat. After the crypts are sufficiently anesthetized, a curved electrode is introduced into each crypt and a sufficient current turned on to produce a white heat before the electrode is applied. In this manner each crypt is thoroughly cauterized, and the patients so treated have enjoyed freedom from subsequent attacks. S. S. Bishop (Medical Times, February, 1914).

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Tonsillectomy versus Tonsillotomy.—It has not been demonstrated that complete removal of the tonsils is followed by a harmful effect upon the general system. Tonsillotomy involves usually less trauma than does tonsillectomy, but in the latter the method of removal is of primary importance, a sharp dissection down to the tonsillar artery, with snaring of the vessels, giving the least amount of inflammatory reaction. Of the two operations, tonsillectomy shows a larger percentage of septic complications, due both to the greater trauma usually occasioned, and also the relatively larger number of septic conditions in which of late years an operation is undertaken. The relative frequency of postoperative hemorrhage is not definitely established, but, in view of the available methods of treatment, it is no longer a serious complication if dependent upon local causes.

While gross deformities of the parts involved are not likely to follow tonsillotomy, yet cicatricial occlusion of the lacunar orifices is frequent, and may lead to an intensification of the original chronic inflammation. Tonsillectomy in unskilled hands may be followed by marked and injurious distortion, but with good technique it should result in no other alteration than an approximation and occasionally a partial fusion of the pillars.

The indications for operation should be determined by the pathologic changes of the tonsils which are actually a detriment to the individual. Simple hyperplasia, if obstructive or favoring catarrhal conditions, and if persistent, may be sufficiently treated by a tonsillotomy, especially in children. The systemic ill effects of chronic tonsillitis may be increased by a tonsillotomy. Complete removal is here preferable to a partial one, although mild cases of chronic inflammation may be sufficiently relieved by appropriate treatment without excision. Infection of the fauces due to virulent micro-organisms may not be prevented by removal of the tonsils.

Recurrent local infections or general infections having their origin in the tonsils require tonsillectomy as soon as a favorable moment for operating arrives. Tonsillotomy may be expected here to prove inadequate. Recurrent acute catarrhal infections of the throat require complete removal of the tonsils if these show chronic inflammation, although immunity against subsequent attacks is not necessarily secured. Local tuberculosis of the tonsil requires complete removal of the organ.

In young children with adenoid enlargement requiring removal, the tonsils should not be excised unless demonstrably causing injury or favoring attacks of acute middle-ear inflammation.

If an impairment of the speaking voice is dependent upon tonsillar disturbances, these may be corrected according to the principles already given, and if a tonsillectomy is indicated it may with proper technique be performed without anxiety.

In singers slight alteration in the tension of the palatal muscles may influence the voice either favorably or unfavorably. In the case of beginners with harmful alterations of the tonsils a partial or complete removal may usually be done, if the local or general welfare of the patient demands it. With increasing length of singing experience, a correspondingly conservative attitude should be maintained, particularly in respect of truly fine voices. J. L. Goodale (Boston Medical and Surgical Journal, October 2, 1913).

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Urinary Antiseptics.—Hexamethylenetetramine (urotropin) is by far the most efficient of all the urinary antiseptics, but liberates formaldehyde only in acid urine. Helmitol, citramine, hetraline, and cystopurin behave precisely like urotropin.

The acidity of the urine is readily increased to more than double the normal by acid sodium phosphate in the average dosage of gr. xv t. i. d., and to a less extent by benzoates. With large doses of citrates it is easily rendered alkaline, *e.g.*, with sodium citrate, gr. xxx t. i. d.

Sandalwood oil, though not an efficient general urinary antiseptic, seems to have a specific action on the

staphylococcus, which possibly accounts for its reputed favorable action in gonorrhea.

Benzoic and salicylic acids are fairly efficient urinary antiseptics, but of little use in alkaline urine.

Boric acid acts efficiently, its action being unaffected by alkalinity. It is the most efficient drug in alkaline urine available.

Uva ursi is a good antiseptic. Its action is certainly not due chiefly to the arbutin it contains. Anson Jordan (British Medical Journal, September 13, 1913).

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Veronal Poisoning.—Toxic symptoms from veronal may be the result of: (1) A special idiosyncrasy; (2) an excessive dose; (3) repeated small doses, as in the veronal habit. The symptoms after a single large dose are drowsiness, headache, and sometimes ataxia. The patient falls into a deep sleep. In severe cases the sleep deepens into coma, and the patient becomes cyanosed, with rapid and often stertorous breathing. In this stage a marked rise of temperature, even to 103° F. or more, is common, and a physical examination of the lungs will probably show areas of dullness on percussion, increased vocal resonance, bronchial breathing, and moist sounds. These signs will be accompanied or followed by those of a general edema of the lungs, such as moist, bubbling râles all over. It is quite easy for a severe case of veronal poisoning to be mistaken for pneumonia, and the author has known the mistake to be made on several occasions. When deep coma and pulmonary symptoms develop it is uncommon for recovery to occur. Sometimes a condition of coma and high temperature will last for as long as four days before death supervenes, but after a very large dose death may occur in less than twenty-four hours.

It is said that digestive disturbances, nausea, and vomiting occur. They undoubtedly do in chronic veronal poisoning (veronal habit), but in the author's experience they are uncommon where a single large dose is taken. Skin rashes are erythematous and of a rubeoliform or scarlatiniform character. It is stated that occasionally urticarial rashes occur and also extreme pruritus and edema of the face. In the author's experience skin rashes have not been common after veronal. He has not observed urinary disturbances except slight albuminuria. In several severe cases he has noticed a remarkably free excretion of urine, but often the urine has to be withdrawn by the catheter when the patient is in a comatose condition.

In chronic veronal poisoning (veronal habit) the patient often develops an abnormal mental condition; visual hallucinations are common, and delusions may also occur: a sort of double self may exist subjectively. Tremors and marked ataxia are common, and the condition may resemble cerebellar disease. The speech is often thick and indistinct, and visual disturbances may occur. The gait is commonly quite reeling. A complete disorganization of the moral sense is caused.

In cases of renal disease veronal is much more toxic than with normal patients. It is important also that constipation should be avoided if the drug is being given frequently. In these conditions a cumulative action

may occur if it is given in therapeutic doses continuously.

In a healthy adult a dose of about 50 grains would be dangerous, and this might be regarded as an average minimum fatal dose. Much larger doses have been taken without death resulting, but, on the other hand, fatal cases are recorded from doses of 15 grains.

Undoubtedly tolerance to veronal may be established in some cases, but one comparable to that in morphine and cocaine takers does not occur. Even where patients are accustomed to taking the drug a dose of about 50 grains is likely to produce deep coma which may be followed by death.

Treatment.—If the patient is seen soon after the taking of the drug—within four hours—one should pass into the stomach a soft stomach-tube to which is attached a piece of plain rubber tubing about 3 feet long in the end of which is a glass funnel. When the tube is in the stomach, some warm water should be placed in the funnel, and the funnel raised, so that the tube becomes filled with water. Before the funnel is empty it is quickly depressed, and this will start a syphon action, so that the contents of the stomach can be syphoned out. When the stomach has been emptied as completely as possible it should be washed out thoroughly by introducing about 2 pints of warm water and then syphoning this off. This should be repeated three or four times. Before withdrawing the tube, about 1 pint of hot, strong coffee with some milk, and an ounce of castor oil or other suitable aperient, should be introduced and left in the stomach.

Cardiac stimulants should be given, such as strychnine, $\frac{1}{30}$ grain, with digitalin, every four hours. Warm normal saline should be given subcutaneously, and also rectal injections of normal saline, containing 4 per cent. of glucose, to the amount of 15 oz. given every four hours. If there is much cyanosis oxygen should be given, and when the pulse is feeble the oxygen may, with advantage, be passed through a wash-bottle containing absolute alcohol. During the comatose state attention must be paid to the bladder, the urine being drawn off by a catheter if necessary. If urine is not being excreted freely, injections of caffeine may be given every four hours. Other stimulants that may be given if necessary are camphor and pituitary extract hypodermically.

The state of coma may last several days. It will, therefore, be necessary to feed the patient. Warm milk, and milk and coffee, may be given every four hours, either by the stomach-tube or by a nasal tube carefully passed. W. H. Wilcox (Lancet, October 25, 1913).

Clinical Summary

Practical hints from articles and abstracts that have appeared in the Monthly Cyclopedia and Medical Bulletin during the current year.

Acne. TREATMENT. Acne vulgaris in childhood or adolescence responds well to thyroid treatment. Thymus employed with advantage in cases with enlarged thyroid and rapid heart. *Morris.* Page 11

Acromegaly. TREATMENT. Case of acromegaly in which thyroid treatment caused headache, dizziness, vomiting, and melancholia to disappear, while pituitary treatment always caused their return. *Salomon.* 30

Amenorrhea. TREATMENT. In amenorrhea, flooding, dysmenorrhea, etc., mammary extract treatment often proves corrective. *Berkeley.* 20

In amenorrhea, relative or absolute, ovarian extract considered best remedy by author. *Bandler.* 91

Anemia. TREATMENT. Joint administration of ovarian extract with iron and arsenic in anemias, including chlorosis, in females, recommended. *Bandler.* 91

Angina Pectoris. TREATMENT. Concussion at level of seventh cervical vertebræ, together with hypodermic injection of 1/10 grain (0.006 Gm.) of pilocarpine, to increase vagus tone, gives relief more promptly than does morphine. *Jarvis.* 160

Ankylostomiasis. TREATMENT. Betanaphthol in 30-grain (2 Gm.) doses given the first thing every morning is likely to prove more effectual than eucalyptus or thymol. Starvation of patient during such treatment is unnecessary; in bad cases it may be harmful. *Keith.* 165

Arthritis Deformans. TREATMENT. Gradual but permanent improvement noted in a number of cases after administration of thymus extract. Pain and swelling disappear and appetite returns. Nucleoproteid extract much preferable to crude gland. Treatment should cover several months, and small doses be continued for some time after apparent cure. *Berkeley.* 20

Bronchopneumonia. TREATMENT. Hot baths, followed by brief cold affusion, in acute bronchitis, bronchiolitis, and bronchopneumonia in young children reduce fever, stimulate expectoration, deepen breathing, exert soporific effect, improve appetite, stimulate elimination through skin, and seem to act specifically in shortening disease. Bath water is at 41° C. (105.8° F.), hot water being added as cooling occurs. Patient is bathed every three hours, up to 5 times a day. Baths particularly appropriate for feeble children who became chilled at periphery with internal temperature high. The weaker the child and higher the fever, the more frequently baths are given. Where the temperature not above 39° C. (102.2° F.), ten-minute bath is given 3 times a day. Hot bath is not contraindicated where temperature exceeds 40° C. (104° F.) in infants or very young children, though for older children warm baths may be substituted. At conclusion of each bath nurse elevates child from hot water so back of neck is exposed, and cold water is dashed once over neck, causing reflex gasp for breath. Child is next reimmersed momentarily in hot water and cold water poured on chest, after which he is dried, wrapped in warmed clothes, and placed in warmed bed. Baths to be continued once daily into convalescence if patient coughs. *Arneth.* 55

Constipation. TREATMENT. Constipation and rectal irritation in neurasthenics greatly benefited by the perineal and anal douche, hot as can be borne, followed by cold douche at 60° to 50° F.; stronger revulsive effects are obtainable with an alternate hot and cold application. *Pope.* 50

Corneal Ulcer. TREATMENT. Bathing part with 1 per cent. ethyl hydrocupreine solution for one-half minute every hour, six hours first day and twelve on next, found rapidly effectual in a case of ulcus serpens with hypopyon from chronic dacryocystitis. Sac expressed and conjunctiva cleansed with boric acid before each treatment with ethyl hydrocupreine, which was dropped on the ulcer. Practically specific against pneumococcic infections. *Wiener.* 168

Delirium Tremens. TREATMENT. (1) Withdraw cerebrospinal fluid by lumbar puncture in amounts as large as possible—50 to 60 c.c. (2) Inject with syringe an equal amount of sterile 1 per cent. sodium bromide solution. Immediate improvement in delirium usually occurs, followed by temporary return and then permanent disappearance of delirium. Relapse occasionally after a few days; usually controlled by repetition of injection. *Kramer.* 110

Diabetes Mellitus. TREATMENT. Therapeutic value of an "easy nitrogenous diet" pointed out, *i.e.*, of one consisting almost exclusively of milk and its derivatives, cereals, fruits, and vegetables. Such a diet partially takes off burden of nitrogenous metabolism from liver and tends to relieve its instability as regards glycogenic function, therefore often causing glycosuria to disappear. *Cornwall.* 110

Dysentery, Bacillary. TREATMENT. In acute form: (1) Rest and warm covering; (2) only small amounts of food at a time; (3) calomel at the outset; (4) acid drinks; (5) enemata of saline or soda solution or of methylene blue. In chronic form: (1) Rest; (2) enemata of 1:500 or 1:1000 silver nitrate, 0.25 to 0.5 per cent. tannic acid, 1:500 or 1:1000 thymol, 1 to 2 per cent. resorcinol or creolin, or enemata of gum arabic mixed with bismuth subgallate or iodoform; (3) phenyl salicylate, tannigen, ichthyol, or calomel internally; (4) serum treatment, 10 c.c. in mild cases, 10 c.c. twice at six- to ten- hour interval in medium cases, and 40 to 60 c.c. in severe cases, not exceeding 20 c.c. at a time when serum used daily; (5) appendicostomy or cecostomy with irrigation in severe cases. *Bassler.* Page 111

Dysmenorrhea. TREATMENT. Cocaine applied to tuberculum septi in nose and anterior portion of inferior turbinate on both sides, followed by application of trichloracetic acid over these spots, in 93 cases. Four applications made between periods. Cases with premenstrual headache, nausea, and colic at onset of flow—but without organic pelvic lesions—completely relieved. Of 81 cases sending subsequent reports, 48 had been cured and 14 improved. *Mayer.* 167

Eclampsia, Puerperal. TREATMENT. Report of 2 cases in which pituitary extract injections—2 in each patient—yielded successful results, labor being brought on thereby. *Schlossberger.* 28

Eczema. TREATMENT. Both chronic and acute forms respond to thyroid treatment. Fat subjects and those with xerodermia respond best. *Morris.* 11

In mild acute cases paint on lesions an aqueous solution of picric acid several times daily; in more severe cases apply wet dressings of the acid, held by facial mask. Prompt and gratifying results. In subacute and chronic types cure hastened by beginning treatment with two or three days' application of picric acid solution. *Wilcox.* 176

Edema, Angioneurotic. TREATMENT. Pituitary and adrenal preparations found useful. *Morris.* 11

Epithelioma. TREATMENT. Concentrated sunlight, focused on growth with ordinary magnifying glass, found effectual. Useful where X-rays and radium not available. Invariably successful in obstinate recurrent ulcerative patches on face or nose. Focus sunlight on sore for ten or fifteen minutes at a sitting. If scab present, concentrate rays till burning is felt, then lengthen focus to cover wider area. Induce burning again every few minutes. Treat every day or two till scab easily removed, then apply a little cocaine and after three or four minutes apply rays so as almost to cauterize base of ulcer. Alternate with milder applications for fifteen minutes. Under milder treatments thereafter, at longer intervals, cure usually complete in three to six weeks. *Seelye.* 166

Erysipelas. TREATMENT. In severe erysipelas a single small vaccine inoculation,—5 million,—preferably of autogenous vaccine, will usually cause a critical fall of temperature, and a second or third dose at about five days' intervals generally completes resolution. *Whitfield.* 56

In facial erysipelas: Have beside bed bowl of boric acid solution in which ice is placed. Keeping cloths frequently moistened with the solution continuously on face effectually relieves pain and burning. Where leg or arm involved: Wet dressings of boric acid or aluminum acetate. In migratory cases: Ichthyol may be applied or surfaces painted with picric acid solution. *Erdman.* 112

Pyramidon used in 20 cases with uniformly favorable results: Diaphoresis, antipyresis, sedation, fading of eruption, which ceases to spread, and improved general condition. Diuretic beverages also given. Locally, following ointment used: Phenolis, camphoræ pulveris, ana gr. xv (1 Gm.); adipis lanæ hydrosi, petrolati, ana ℥ss (15 Gm.). *Satre.* 167

Discomfort and pain more rapidly relieved by picric acid solution than other agents, and edema disappears promptly. *Wilcox.* 176

Furunculosis. TREATMENT. Where boil already soft: (1) Paint tincture of iodine freely over and around it; if several lesions close together, paint over entire area. (2) Place gauze pad with 10 per cent. ichthyol in petrolatum over the area, cover with a little cotton, and hold with bandage. (3) Next day, remove pus, wipe with benzine, and reapply iodine and ichthyol. (4) When pus entirely absorbed, discontinue iodine, but apply pure ichthyol. (5) To activate epithelial growth where necessary: Argenti nitratis, gr. xv (1 Gm.); balsami peruviani, gr. lxxv (5 Gm.); adipis lanæ hydrosi, ℥iiiss (100 Gm.).—For a furuncle not yet softened: (1) Apply iodine. (2) Thick coating of ichthyol, to be allowed to dry on or covered with a little absorbent cotton and gummed adhesive. (3) Next day, wipe off ichthyol with warm water or if possible wash area with soap and water, and reapply iodine and pure ichthyol. (4) Stop iodine on third or fourth day, continuing ichthyol till all inflammation subsided. Single layer of gauze, tissue, or cigarette paper may be applied when ichthyol has dried. *Berger.* 113

Goiter. TREATMENT. Vaccines prepared from coliform bacilli of patient's own bowel administered in 8 cases of parenchymatous goiter, with disappearance of enlargement in one and diminution in the others. Initial dose usually 125 million, later increased, upon diminution of size of goiter, by 25 or 30 million weekly. Injections given weekly. *Langmead.* 23

Salicylates, creosote carbonate, menthol, thymol, etc., are helpful after the intestinal functions have been regulated. In nodular, cystic, colloid, fibrous, and intrathoracic goiters, iodine is seldom of value and sometimes dangerous. *Sajous.* Page 1

Goiter, Exophthalmic. TREATMENT. Ligation of thyroid vessels and sometimes a portion of the gland is indicated (1) in patients with mild symptoms of hyperthyroidism; (2) in the large group having acute, severe exophthalmic goiters, and the chronic, very sick patients who, having exhausted all forms of treatment, are suffering from various secondary symptoms, and (3) in cases with marked pulsation and thrill of thyroid arteries associated with cardiac dilatation and loss of weight. Thyroidectomy later advisable, to prevent relapse to former condition. Should trouble recur before a partial thyroidectomy is made, or a severe relapse after partial extirpation, inferior thyroid artery should be ligated and half of remaining lobe removed when improvement occurs. *Mayo.* 16

In early and mild cases in virgins, author begins treatment with corpus luteum, which is useful as antidote to thyroid intoxication. *Berkeley.* 20

Report of cases improved by administration, for several months, of 20 to 30 Gm. (5 to 8 drams) of quinine divided among twenty days in each month. *Gaultier.* 90

Gonorrhea. TREATMENT. Iodine treatment gave excellent results in gonorrhea in the female: (1) Swab external genitals with a 3.5 per cent. solution of iodine in alcohol; (2) force a few drops of same solution in orifices of Skene's and vulvovaginal glands through blunt hypodermic needle; (3) with patient in Sims's position, insert Sims's speculum, swab vagina dry with cotton, and paint cervix with iodine solution; (4) swab posterior vaginal *cul-de-sac* and wall; (5) introduce narrow strip of gauze high up against posterior wall, and remove speculum; (6) give hexamethylenamine, 5 to 7½ grains (0.3 to 0.5 Gm.) four times daily in plenty of water. Where cervix and uterus chronically involved: (1) Paint cervix with iodine; (2) grasp anterior lip with volsellum and remove any stringy discharge; (3) insert small uterine sound if required; (4) introduce intrauterine syringe to fundus and instill 1 dram (4 c.c.) of iodine solution while withdrawing; (5) treat vagina as in acute cases. Repeat applications every third day in both acute and chronic forms. In all cases order hot douches of 4 to 6 quarts (liters) of hot saline two to four times daily, always followed by a 1-quart (liter) injection of 1:5000 permanganate or 1:250 picric acid. *Hofmann.* 48

Gonorrheal Vaginitis of Children. TREATMENT. Mixed autogenous vaccines of gonococcus and usually staphylococcus, streptococcus, diplococcus, colon bacillus, etc., used in 40 cases with uniformly good results. Average number of injections required for cure, 7. Initial dose, 25 to 50 million, then gradually increased. Interval between injections not less than five nor more than seven days. If after six weeks case still needs treatment, as shown by examination of discharges, a second vaccine should be made. *Wolff.* 49

Headache. TREATMENT. In headache or head pressure in nervous fatigue a fomentation applied for five or ten minutes twice, and followed by a cold compress, is effective. If headache is congestive, use hot foot bath, followed by ice-bag to nape of neck and cold compress to forehead. Sitz baths at 90° F., or cold foot baths, often relieve. *Pope.* 50

Hemorrhage, Cerebral. TREATMENT. Venesection used with good results and recommended in cases of apoplexy in full-blooded patients with blood-pressure of 200 mm. or more. Amount of blood let in author's cases, 12 to 48 ounces. Where vein at elbow not easily found in stout persons, there are usually varicose veins in legs which can be opened. *MacFarlane.* 121

Hernia. TREATMENT. Inversion of hernia recommended in patients who take anesthetic poorly and maintain strong expiratory efforts, forcing viscera into sac under pressure. Primary union and cure of hernia in each of author's 7 cases thus dealt with. *Haynes.* 170

Herpes Labialis. TREATMENT. Picric acid solution causes rapid drying of lesion and tends to prevent extension. *Wilcox.* 176

Hodgkin's Disease. TREATMENT. Benzene, 5 minims (0.3 c.c.) three times daily at first, then increased to 10 minims (0.6 c.c.), caused marked regression of enlarged nodes, beginning two weeks after treatment begun, in a case previously treated unsuccessfully with X-rays. The 10-minim dose was continued for six weeks. *Lawson and Thomas.* 173

Hyperchlorhydria. TREATMENT. Cream diet considered useful. (See Ulcer, Gastric.) *Nichols.* 169

Impetigo. TREATMENT. In exceptional cases which do not yield to local measures, a few staphylococcic vaccine inoculations—usually, in fact, a single one—will cause prompt cure. *Whitfield.* 56

Insomnia. TREATMENT. In nervous fatigue (neurasthenia) this symptom is best met by cold pack or dripping-sheet at bedtime, or by the trunk compress, consisting of a coarse linen bandage wrung out of water at 65° F. and covered by several layers of same material to exclude air; it should be worn all night. Excellent also is the neutral bath at 94° to 96° F. for from twenty to sixty minutes. *Pope.* 50

Intertrigo. TREATMENT. Paint picric acid solution on surfaces and separate them with thin layers of absorbent cotton. In the more severely infected cases wet dressings of picric acid. Prompt results. *Wilcox.* Page 176

Intestinal Motor Inactivity. TREATMENT. Pituitary extract recommended. Injection of 3 c.c. in adults causes evacuation in 88 per cent. of cases in from six to twenty minutes. Usually constipation later recurs, but often a single injection will induce several stools on same day and keep bowels regular for a day or two after. The extract is valuable for prophylaxis and cure of postoperative intestinal paresis. Continued, it tones up intestine and also stimulates stomach motility. For lasting effect, inject ½ c.c. intramuscularly every day for a week, then 1 c.c. every three days for another week, and thereafter 1½ c.c. once weekly. *Houssay and Beruti.* 27

Intestinal Stasis, Postoperative. PROPHYLAXIS. Harmful effects of abrasion of visceral peritoneum in operations can be overcome by introducing 6 ounces (180 c.c.) of sterilized mineral oil in abdomen and sponging it over coils of intestine. *Burrows.* 52

Lumbago. TREATMENT. Salicyl compounds or a 10- or 20- grain (0.6 or 1.2 Gm.) dose of quinine at onset of condition useful. Rochelle salts, ½ to 1 dram (2 to 4 Gm.) every hour or two until urine alkaline and bowels freely moved, also valuable. "Walking the lumbago off" may succeed if free perspiration accompanies the exercise. Turkish bath in early stage safer and more effective. Later: Rest, dry cups locally, deep massage, faradic current, and, if salicylates fail, iodine, in vegetable protein combination. *Henry.* 175

Lupus Erythematosus. TREATMENT. Benefit followed use of adrenal substance in this condition. *Morris.* 11

Lupus Vulgaris. TREATMENT. Where Finsen light not available, old tuberculin is capable of great service. Begin cautiously; then make steep rise in dose as soon as one dose ceases to call forth reaction. *Whitfield.* 56

Myasthenia Gravis. TREATMENT. Pituitary extract, combined with ovarian, found useful in 2 cases. *Lagane.* 85

Obesity. TREATMENT. Colloidal hydroxide of palladium, suspended in olive oil and liquid paraffin in proportion of 25 mg. of palladium to 1 c.c., caused marked loss of weight, without untoward action except some local irritation, in 2 cases of obesity. Dose, 2 c.c. of suspension, injected under skin of abdomen. *Kauffmann.* 116

Ozena. TREATMENT. Use of sugar recommended. For first week or two surgeon should carry out treatment himself, and precede sugar by removal of crusts from nose, softening them if necessary with hydrogen dioxide or sodium bicarbonate solution. Patient to use nasal syringe once daily. After crust removal, massage mucosa with cotton-tipped probe; then nostrils may be packed with ribbon gauze soaked in simple syrup, to be removed in twelve hours. Repeat this treatment on alternate days. After a fortnight patient can insufflate powdered sugar himself. *Harry.* 175

Paralysis Agitans. TREATMENT. Good results from administration of thyroid and parathyroid preparations with calcium chloride. *Gauthier.* 86

Perinephric Abscess. DIAGNOSIS. Pain referred to lower limb of same side found of considerable diagnostic value. There are both pain and tenderness, particularly marked along external cutaneous nerve just below anterior superior spine and on external aspect of thigh. *Belikov-Chtomitch.* 117

Pneumonia. TREATMENT. Ethyl hydrocupreine hydrochloride given internally in pneumococcic lung inflammation, with good results. Dose usually 0.5 Gm. (7½ grains) *t. i. d.*, daily amount not exceeding 1.5 Gm. (23 grains). In 9 cases no other medication was employed: in all of these temperature fell more rapidly, by crisis or lysis, than with other methods. No untoward after-effects. *Vetlesen.* 118

Poliomyelitis, Acute. DIAGNOSIS. Preparalytic symptom: A peculiar, twitching, tremulous, or convulsive movement of certain groups of muscles, lasting from a few seconds to somewhat less than a minute. Usually affects part or whole of one or more limbs, face, or jaw, but sometimes whole body. Duration of spells short at first. Often accompanied by a cry similar to hydrocephalic, or by brief period of unconsciousness. *Colliver.* 177

Psoriasis. TREATMENT. Thyroid preparations found especially efficacious in psoriasis associated with adiposity. They should not be exhibited until eruption is fully developed. *Morris.* 11

Low nitrogen diet found to have very favorable influence upon psoriasis eruption, especially when extensive. Severe cases improve under such a diet almost to the point of disappearance of the eruption. *Schamberg, Kolmer, Ringer, and Raiziss.* 178

Application of picric acid solution brings immediate and constant relief from itching. *Wilcox.* 176

Puerperal Fever. PROPHYLAXIS. Whenever irrigation of vagina with boiled water through speculum yields a yellowish fluid, one should irrigate once daily for at least ten days with a 1:200 solution of lactic acid. Morbidity thereby reduced from 28.6 to 7.6 per cent. Full baths to be avoided before delivery. *Zweifel.* 54

TREATMENT. Intravenous injections of distilled water given in 142 cases of puerperal

fever. Of 62 patients with pyemia and septicemia, 42 were cured. In an hour or hour and a half after an injection there is usually a chill, with rise in temperature. By evening or the following morning temperature will have fallen to normal, sweating usually accompanying the drop. *Ilkewitsch.* Page 53

Puerperal Sepsis. TREATMENT. Fixation abscess recommended in this and other severe infectious states, including pneumonia, appendicitis, typhoid fever, etc., whenever condition seems to be taking a turn for the worse. Inject 2 c.c. of pure oil of turpentine under gluteal skin. When abscess forms, evacuate through small incision (do not drain) and apply Bier cups twice daily. Excellent results in 18 cases. *De Lostalot.* 168

Rabies. TREATMENT. Potassium iodide in 2 per cent. solution, 1 tablespoonful or dessertspoonful at frequent intervals throughout course of preventive injections, recommended as adjuvant in treatment. In 3 cases of abortive rabies symptoms promptly disappeared after use of potassium iodide. Advocated especially in cases where infection has existed in latent condition for some time. *Koch.* 55

Retention of Urine, Postoperative. TREATMENT. Pituitary extract injected intramuscularly in 21 puerperal and 24 postoperative cases with excellent results. *Ebeler.* 91

Ringworm. TREATMENT. Body ringworm more easily controlled by painting on picric acid solution than by usual antiseptic ointment. *Wilcox.* 176

Sciatica. TREATMENT. Eight cases treated by injections of 4 per cent. quinine and urea hydrochloride in salt solution into subcutaneous tissue over course of nerve. Fifty injections in all, without untoward results. Always decided relief after first injection and no further attack after third. Injections daily for 4 doses, then every other day until patient entirely relieved. Two cases of facial neuralgia also treated, with complete relief after second injection. *Cables.* 119

Syphilis. DIAGNOSIS. Luetin test valuable as diagnostic measure in tertiary and latent stages of syphilis, indicating a state of hypersensitiveness to spirochetal proteins induced by a period of cessation of introduction of these proteins previous to the test. Provocative injection of salvarsan, followed by both Wassermann and luetin tests, suggested to ascertain whether treatment has been curative in a given case. *Foster.* 179

Tracheobronchial Glandular Enlargement. DIAGNOSIS. Percussion of thoracic vertebræ, especially those above level of inferior scapular angles, affords tonal changes of clinical value in this condition; these must always be correlated, however, with mural signs in the individual case. In comparison with other (neoplastic) mediastinal masses, tracheobronchial tumors affect vertebral percussion sound less, and oftener produce dullness than hyperresonance. *Da Costa, Jr.* 180

Tuberculosis, Pulmonary. DIAGNOSIS. Contrast between resonance of air-containing tissue and deadness of the airless spot is striking when light percussion practised. If on increasing force of stroke dullness remains, one may conclude that there is an extensive area of airless tissue. A shorter apex on one side is of immense significance. In infiltrated apex a long, held inspiration gives a duller note on percussion than is found over healthy side; this is often of value in doubtful cases. Where history, symptomatology, and course of disease point to tuberculous infection, one may safely diagnosticate tuberculosis without any definite auscultatory signs. *Fishberg.* 54

TREATMENT. Frequency of gastric atony and dilatation, with resulting digestive symptoms and secondary toxic manifestations (aches and pains in chest and right hypochondrium, morning depression, insomnia, hepatic weight, vertigo, chilliness an hour after meals, fleeting edema, etc.), in pulmonary tuberculosis pointed out. Treatment: (1) Support to stomach and abdomen by Rose belt of plaster or moleskin, followed, upon improvement, by supporting belt to be worn continuously and later in daytime only. (2) No liquids with meals or for two to two and one-half hours after. (3) Lunch to be light. (4) Recumbency, with attempt to sleep for one-half to one hour after each meal. (5) No alcohol or fresh bread. (6) Medicinal treatment: Tr. nucis vomicæ, acidi hydrochlorici dil., āā f℥ss (15 c.c.); glyceriti pepsini, f℥iss 45 c.c.); aq. menthæ pip., q. s. ad f℥iij (90 c.c.). Teaspoonful in ½ glassful of water after meals. If much flatulence, add chloroform water, 2 or 3 minims (0.13 or 0.2 c.c.) to the dose, until relieved. (7) Cold shower or sponge baths, with needle bath to abdomen, followed by brisk rub, each morning. (8) Where mucous passages and flatus: Turkish towels, wrung out in hot water, to be applied to abdomen for one-half hour after meals. (9) Thorough mastication of food and abstention from worrying at meals. (10) Fats to be avoided at first. *F. N. Robinson.* 95

Measures to overcome fever described: (1) Where prolonged fever drains on patient's strength, pyramidon is drug to be preferred—5 grains (0.3 Gm.) in cachet at night, or, if necessary, three times a day. In neurotics bromides sometimes efficacious. (2) Rest in recumbency to be insisted on until temperature does not rise above 99° in men or 99.2° in women, when patient may sit in chair for two hours, then recline on couch, in open air if possible. Exercise then gradually increased. (3) Where severe cough, sedative

mixture tends to prevent fever from the exertion and autoinoculation. (4) Where rest and drugs fail, cautious use of tuberculin (T. R. or B. E.), beginning with only $\frac{1}{100000}$ mg., exerts antipyretic action, though often only for short periods. Tuberculin acts best in cases free from fever while at rest, but febrile when exercise taken. *Wethered.* 120

Ulcer, Gastric. Diagnosis. Following combinations practically assure a diagnosis of ulcer: (1) Tender point with occult blood. (2) Hypersecretion with tender point. (3) Hypersecretion with occult blood. (4) Tender point with repeated positive thread tests. (5) Tender point with hematemesis. (6) Hematemesis with hypersecretion. (7) Hypersecretion with positive thread tests. *Verbrycke.* 114

Treatment. Cream diet used with success in 26 cases. One quart (4 glasses) a day yields 1800 calories. To this may be added 600 c.c. of milk or 6 slices of bread or 5 tablespoonfuls of oatmeal gruel or 3 eggs. Cream causes inhibition of gastric secretion. If not tolerated in full strength, it may be diluted with equal or greater amount of milk. Ice-cream a useful variant. Some marked cases progressed to good recovery in two or three months under cream diet. Method adapted for bed or ambulant treatment. Also useful as prophylactic against recurrence of ulcer. *Nichols.* 169

Ulcers. Treatment. In indolent tuberculous ulcers, 1 or 2 doses of old tuberculin usually cause complete healing in a week or two. *Whitfield.* 56

Urticaria. Treatment. Pituitary and adrenal preparations found useful. *Morris.* 11

Vomiting. Treatment. In paroxysmal vomiting of chronic, recurrent character, where no organic disease of stomach is discoverable, adrenal gland treatment is frequently of value. *Berkeley.* 20

Vomiting of Pregnancy. Treatment. Apomorphine, $\frac{1}{336}$ grain (0.0018 Gm.) in a teaspoonful of water, found effectual in a severe case; likewise in other cases of vomiting or nausea. *Field.* 182

Vomiting, Postanesthetic. Treatment. When vomitus of hemorrhagic type, give 5 to 10 minims (0.3 to 0.6 c.c.) of 1: 1000 epinephrin hydrochloride in a teaspoonful of water. Cessation of vomiting follows. *Keay.* 93

Whooping-cough. Treatment. Vaccine containing 20,000,000 dead *B. pertussis* per c.c. used in about 70 cases. Infants received $\frac{1}{3}$ c.c. as initial dose and $\frac{2}{3}$ c.c. four days later; others, $\frac{1}{2}$ c.c. and 1 c.c. Prompt, uniformly good and often striking results obtained. In cases already having a bronchopneumonia as complication, a mixed vaccine should be used. *Davidson.* 118

Silver nitrate in 2 per cent. solution applied to throat in 95 early cases to prevent spread of infection downward from pharynx. Useful results in 84 instances. Mucus secretion prevented and coughing spells due to irritation by secretion minimized. Silver solution applied every day at first; later, and in older children throughout, on alternate days. *Ochsenius.* 182

Wounds. Treatment. Stream of air from ordinary electric fan or register found useful in drying and promoting healing in large wounds, obstinate leg ulcers, and discharging eczema. *Heisler.* 182

Book Reviews

A Textbook of Physiology for Medical Students and Physicians. By William H. Howell, Ph.D., M.D., Professor of Physiology, Johns Hopkins University, Baltimore. Fifth Edition, Thoroughly Revised. Octavo of 1020 Pages, Fully Illustrated. Philadelphia and London: W. B. Saunders Company, 1913. Cloth, $4.00, net; Half-morocco, $5.50, net.

Since the appearance of the fourth edition of Professor Howell's textbook, only two years ago, certain important changes in physiologic views have taken place, more especially as regards metabolism and the mechanism of nitrogenous nutrition of the body. Our knowledge of intermediary metabolism has been gradually enlarged through the extensive researches being done in physiologic chemistry. Among the recent work noticed in the text is that of Tashiro on the production of carbon dioxide in nerves, resting or active; that of Cannon and Washburn and of Carlson on hunger sensations, that of Schilling-Torgau on the histologic structure of the red corpuscles, that of Whipple on the effect of phosphorus poisoning on the blood, that of the author himself on blood coagulation, that of Cohn, Kessel, and others on the cardiac contraction wave, that of Meek and Eyster and of Einthoven on electrocardiography, that of Folin and Denis and of Van Slyke on the absorption of amino-acids into the blood during digestion, etc. On page 553 appears the term "palsus irregularis

pepctuus," requiring two corrections. Recent research on epinephrin secretion and the functions of the pituitary is briefly referred to; also the newer views on the production of diabetes. On the whole, the book may be said to afford a most excellent presentation of modern physiology. The worth of Howell's textbook as an introduction to the subject for the student has been fully proved by the popularity of the previous editions, and the new issue will undoubtedly be received with equal favor.

Sex, Its Origin and Determination. By Thomas E. Reed, M.D., Middletown, O. 313 Pages. New York: Rebman Company, 1913.

The contents of this volume are summarized by its author as follows: 1. A general review of the methods of reproduction in the animal kingdom. 2. A review and criticism of foregoing theories of sex determination. 3. A demonstration of the primitive hermaphroditism of all animal organisms and the latent bisexuality of even the highest forms. 4. An inquiry into the nature of twin births and a demonstration of the importance of the study of twin births in its relation to the problem of sex determination. 5. A demonstration of the bisexual rhythm in the germ plasm. 6. A study of the influence of the lunar month and lunar day on the phenomena of menstruation and also of gestation and other normal functions, fluctuations in the course of infectious disease, the progress of labor, and the determination of sex. The author's view can be summed up in the statement that "sex is determined by the time of fertilization." He also holds that "maleness is katabolism, and femaleness anabolism." From the practical standpoint, he claims to have recorded a number of cases in which patients, by following his directions, were able to secure a desired sex in offspring. In many other instances the sex was successfully predicted. On page 279 appears a table, intended to enable the practitioner to calculate the time of labor and name the sex of the child. While detailed accounts of the author's successful prognostications are given, their number is not very large and therefore not very convincing. His conclusions, however, are based on well-ordered and critically examined material, and the book may be said to be, at least, worth reading.

Coprostasis: Its Causes, Prevention, and Treatment. By Sir James Sawyer, M.D., F.R.C.P., F.R.S., Formerly Professor of Pathology, then of Therapeutics, and lastly of Medicine in the Medical School of London University; Consulting Physician to the Queen's Hospital, etc. Pages 74. Birmingham: Cornish Bros., 1912.

This little book comprises some of the chapters of the fifth edition of the author's "Contributions to Practical Medicine," set apart to form a monographic work on coprostasis. The author recognizes that, in view of the complex and numerous conditions with which coprostasis may be associated, routine treatment may prove disastrous, and each case requires careful investigation of the cause before treatment can be instituted with uniform hope of success. In the first chapter the treatment of constipation without drugs is set forth, and the advantages of regularity of effort, proper position of the body in defecation, an erect carriage, exercise, and diet emphasized. The second and third chapters include a summary of the etiology and prevention of habitual constipation, and points in the treatment of more pronounced fecal retention, with remarks on enemata and the use of O'Beirne's tube. Chapter IV deals with intestinal obstruction, Chapter V with what the author terms "lumbago coprostatica," and Chapter VI with the author's methods of treating hemorrhoids, in particular with the use of an ointment or suppository of the common English wild plant, *Ranunculus ficaria* (pilewort or lesser celandine). Many useful hints for practice are presented in this genially written little volume.

The General Field

Conducted by A. G. CRANDALL

A Thankless Profession

It is but reasonable to suppose that the normal young man, in selecting an occupation or profession, should be influenced, to a certain extent at least, by the prospective attitude of his fellows. Surely the approval of one's associates is no small item in a world so small as ours, where the plaudits of the multitude or retributive justice cannot well be escaped.

A strongly developed sense of duty may, however, overrule all other considerations and point the way to a life of inevitable sacrifice with few compensations except an approving conscience. As an example of such an unappreciated sacrifice the weather forecaster probably stands at the head.

In most of life's ventures in which chance must necessarily play its part, luck does not always do us tricks. Even in the stock market, or in buying gold-mining stocks of one's trusted friends, there is an occasional chance of winning. Fairly good five-cent cigars often do not average to cost over fifteen cents each when secured as prizes at the cigar-store slot machine. It is such knowledge that places the weather forecaster in such a sad contrast.

It is an old proverb: "Lucky at cards; unlucky in love." Possibly this holds good in predicting the weather. If so, there are compensations after all.

* * *

An Alluring Idea

A social worker, speaking to the women of a certain church in Philadelphia, informed them that Moses was a walking delegate, leading the children of Israel out of Egypt because they were not paid sufficient wages. He also gave them to understand that the men who did not work had scriptural authority for demanding wages just the same by quoting the parable of the "eleventh hour."

While a good many of the "unemployed" who are now busy stirring up social and political ill feeling find it irksome even to work the eleventh hour, the above-outlined theory of social ethics shows how many ways there are to distort a philanthropic sentiment.

The literature of this rather critical social era frequently refers to the "dignity" of labor, but it is seldom that any writer on this subject of far-reaching importance ever dwells upon the physiologic benefits of systematic labor. This is a subject that should be elucidated so plainly and so clearly that all people who have reached the age of discretion and intelligence may understand how essential systematic occupation is to normal health.

Nothing is more harmful to the cause of social justice than the ventilation of the idea that the world owes every laborer a living, irrespective of the amount of skill and real effort he is willing to deliver.

* * *

The Erect Posture

We learn from eminently successful newspapers that the erect posture is absolutely essential to anything like a normal action of the lungs, heart, stomach, and other rather necessary furnish-

ings of the human anatomy; also that a good many architectural mistakes in said anatomy are plainly visible to any really artistic observer.

We find upon this authority that the human stomach is a wonderful thing which must not be deflected from the crooked and narrow path. It should not be permitted to crowd against the heart by day or take advantage of a sleepy liver by night. All that is necessary to provide each human stomach with a correct perception of ethics is to stand erect.

As we look about us we are encouraged by numerous examples of the stern determination to preserve the erect position regardless of cost. Automatically as the abdomen of obesity projects do the shoulders retract. Thus is the center of gravity preserved and an outlet, or perhaps we should say annex, is provided for surplus development of the digestive machinery.

We believe that much of this anxiety as to posture is needless. Nature provides each individual with a separate code. "One man's meat is another's poison." The well-fed office man, bending over his desk, cramping his lungs in a bad atmosphere, may yet have developed an immunity far surpassing that of the erect open-air giant whose instinct for the balanced ration is defective. To neither overeat nor undereat is to have solved one of the greatest hygienic problems.

* * *

A Theory That Doesn't Work Out

A certain class of enthusiasts are going to do away with the so-called social diseases by the simple process of educating everybody in all the nauseating details of these diseases.

This is a theory that will not stand the test. It has been stated, and is doubtless true, that of all classes of young college men the medical student, who is logically best informed as to the contagion risk of venereal disease, is the most likely to acquire it.

It is natural that young men who have been raised in a slum neighborhood and who have become familiarized with the pathologic consequences of dissolute living should have a knowledge which would protect them to a far greater extent than the young men more happily situated in their early lives who have never come into contact with the visible signs. Yet it is in these districts that such disorders are most prevalent.

Altogether it is a question whether universal information as to the details of venereal disease and the usual modes of acquiring it is not more of a danger than a protection.

Sanitation involves a good many essential, but not especially edifying, details. Just why it should be necessary for everyone to understand all the aforesaid details in order to exercise reasonable sanitary habits has not yet been made clear.

* * *

Steady Progress

A prominent suffragist who came into the limelight by a sensational marriage a few months ago has further evidenced her advanced ideas by agreeing with her husband to throw away the wedding ring, which she says is only a relic of barbarism indicating the enslavement of women.

One of the primary objects of civilized marriage is the birth of children. We have the impression that the second generation, if there is one, will hardly

look back with pride upon this episode in the family history.

This incident would be unworthy of note save for the evidence of the rapid progress usually to be observed among those who cast aside the "trammels."

* * *

Unfortunate Tendencies in the Philippines

The Director of Health of the Philippine Islands, before the upper house of the Legislature, recently argued for three days in opposition to the proposed radical decrease in the appropriation for his department.

Whether he will get a sufficient appropriation or not is very doubtful. The tendency under the present administration of affairs in the Philippines is to relax the vigilance which was considered essential to the proper conduct of affairs under the administrations of Presidents Roosevelt and Taft.

Naturally there is a feeling of great insecurity manifesting itself among American residents on the Islands.

The injection of partisan politics into a matter of such grave importance as the question of sanitation in the Philippines is certainly regrettable.

* * *

A Unique Will

A woman of Philadelphia who died a year or two ago in her will devised to Swarthmore College the sum of $2,000,000 on condition that athletic sports be abolished from that institution. The trustees of the college had most excellent uses to which they could have applied this large endowment, but they considered the price too high and declined to accept the bequest. It will now be devoted to other charitable purposes.

It is difficult to comprehend the mental processes which would lead to the execution of so strange a bequest, but it is fair to presume that they were pathologic rather than normal.

Nothing is so conducive to healthful mental and moral atmosphere in a coeducational school as a well-organized system of athletics. Under such conditions a robust male student can consistently parade his physical prowess while the female of the species looks on and applauds.

There must, as a natural course, be a kink in that line of reasoning which leads to the conclusion that such natural manifestations of youthful virility are objectionable.

* * *

The Milk Question Again

Notwithstanding the assurances of a large number of physicians, the prejudice against pasteurized and sterilized milk will not down.

After a woman has drunk milk in its normal state, or milk diluted with other fluids for a time, as an aid in lactation, she is quite prone to acquire a condition of entire cheerfulness over the prospect of later on being able to dispense with the indulgence of milk in any form, and the idea of forcing semi-cooked milk upon the helpless infant does not appeal to her sense of justice. Therefore, if the child must have milk, she is in favor of its having it in the most palatable form possible. It seems that at last science is coming to her assistance on the principle of the production of immunity by the infinitesimal dose. It is now suggested that the

period during which the child is protected to a considerable measure by the antitoxin contained in the milk is the best possible time to immunize that child against the possible infection of tuberculosis. Thus, according to this line of reasoning, the employment of pasteurized milk, rendering infective germs inert, prevents the development of this process of immunity, so that the child may be less prepared to resist infection in later years.

This is certainly a novel way of settling a question which involves so much perplexity. It is, in fact, about as practicable to provide for a community an abundant supply of absolutely guaranteed milk as it is to provide prospective bridegrooms with authentic certificates of absolute freedom from any form of disease. The city demand for milk is steadily increasing and the supply in the country is relatively decreasing.

* * *

They Live Long

The actuary of the New York Life Insurance Company has been doing some investigating and announces the results as follows: "Be a spinster and live long."

Owing to a general feminine awakening as to the shortcomings of the human male, the longevity of spinsters is likely to become an item of great importance in the life-insurance business. More and more women are "getting wise" to the bombastic egotism of mere man and resolving to let him sew on his own buttons and darn his own socks.

Left to his own devices, the bachelor wends his weary way subsisting upon the commercial culinary products of the restaurant and boarding house. For him no giddy whirl of joy and relaxation at the movies. After a brief time all theatrical comedies look alike to him and he falls back for solace upon his pipe and, alas! sometimes the high-ball. And the spinster—with what a sense of relief does she return to her apartment after an evening with some married friend and her vociferous offspring.

All this has its influence, and the insurance actuary with his Sherlockian instinct of figures has set the sad fact down in black and white. Woman lives longer unmarried. "Of all sad words of tongue or pen" is likely to be the refrain of the married woman hereafter rather than of the old maid.

And yet it might be appropriate to say that in some instances woman will prefer "a short life and a married one."

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COMMON SENSE IN MANAGING DIGESTIVE DISORDERS.

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(CONTINUED ON ADVERTISING PAGE 33.)

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ditions we seek to correct are very apt to be aggravated. Undoubtedly we have placed too much reliance on the digestants and as a consequence have often done more harm than good. As one physician states in referring to the digestive function: "Nature should be gently assisted in the human economy. If we persist in doing its work, like the lazy man, it soon depends on that assistance. This is true to the action of the liver, stomach, intestines, as well as all functions of the human anatomy. How often do we meet with individuals who are habitually dosing themselves whenever an action of the liver or bowels is required, and others who require a dose of pepsin or one of the many artificial digestives after each meal. This is all wrong. The functional activity of the entire process of digestion should be encouraged, and any remedy that will specifically stimulate these functions to their healthy action is of greater service in digestion than pepsin. Seng, a remedy that has a well-defined secernent action on the glands and mucous membranes of the stomach and intestines, thus compelling the secretion of Nature's own digestive fluids, is the modern treatment for dyspepsia.

PLACING THE BLAME.

At the present day much discussion is being heard on every side concerning the rôle of the intestinal canal in the causation and development of innumerable diseases. Once the liver was the chief malefactor, and a disordered liver if not blamed as the chief cause of pretty nearly every disease that "human flesh is heir to," was sure to be considered particeps criminis. As the indictment of the liver has been narrowed and its culpability brought within more specific limits, some other culprit has become necessary. How natural to turn to the liver's closest associate and known accomplice, the intestinal tract. Thus it is that the "human cesspool," as Sir Wm. Arbuthnot Lane has styled the intestinal canal, has had to stand accused of the etiologic crimes that the liver is no longer held accountable for.

But, as always happens, interest in the depravity of the new culprit has made the actual

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misdeeds of the old lose much of their importance. And so, gradually but none the less surely we have grown to ignore the crimes of the liver, until at last in our indignation at and fear of the intestines, we are almost ready to look upon the liver as "more sinned against than sinning," a victim of hasty and unwarranted accusation.

With this state of affairs, it is not surprising that the liver, wily and dangerous old offender that it is, has been allowed to perpetrate many outrages without being called to account. It is high time that medical men awoke to the fact that the liver is the same old trouble-maker it has always been, and needs watching as closely as ever.

Indeed, recent study of intestinal stasis and associated conditions has shown that the liver is often the main culprit even in this affection. The action of the bile in controlling intestinal putrefaction, arresting bacterial activity, promoting peristalsis, and assisting digestion makes it highly necessary that this important secretion be frequently interrogated as to its quantity, and any decrease in the bile output be given instant and vigorous attention.

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